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HERBERT FRIEDMANN, *Chairman*

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PUBLICATION NOTE

By a change in the By-Laws of the Biological Society of Washington, effective March 27, 1926, the fiscal year now begins in May, and the officers will henceforth hold office from May to May. This, however, will make no change in the volumes of the Proceedings, which will continue to coincide with the calendar year. In order to furnish desired information, the title page of the current volume and the list of newly elected officers and committees will hereafter be published soon after the annual election in May.

All correspondence should be addressed to the Biological Society of Washington, c/o U. S. National Museum, Washington, D. C.

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The Committee on Publications declares that each paper of this volume was distributed on the date indicated on its initial page. The contents, minutes of meetings, and index for 1949 (pp. v-xii, 197-206) were issued on May 11, 1950. The title page and lists of officers and committees for 1948-1949 (pp. i-iv) were issued on November 16, 1949.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS

The Society meets from October to May on the second Saturday of each month at 8 P.M. All regular meetings during 1949 were held in Room 43 of the U. S. National Museum except the 984th meeting, held in the National Museum auditorium.

979th Meeting—January 8, 1949

President Aldrich in the chair; 72 persons present.

Informal Communications: Malcolm Davis, Note on the observation of a European ruff; Lorina Wendt, Note on the observation of crossbills at Lebanon, Virginia.

Formal Communication: Richard E. Griffith, Conservation of Alaska's wildlife resources.

980th Meeting—February 12, 1949

President Aldrich in the chair; 74 persons present.

New members elected: Ethan D. Churchill, E. Thomas Gilliard.

Informal Communications: Mr. Owen, Note on observation of a seal in upper Chesapeake Bay; J. W. Aldrich, Note on the nesting of the barn owl in the Smithsonian tower.

Formal Communication: Reese I. Sailer, The bloodsucking insects of Alaska.

981st Meeting—March 12, 1949

President Aldrich in the chair; 64 persons present.

Informal Communication: Frank Thone, Exhibition of new books on biological subjects.

Formal Communication: Robert F. Black, Geology of Alaska and its biological significance.

982d Meeting—April 9, 1949

President Aldrich in the chair; 74 persons present.

Formal Communication: Hugh O'Neill, Vegetation of Alaska.

Special Meeting—April 15, 1949

Joint meeting with the Washington Academy of Sciences and the Entomological Society of Washington.

Formal Communication: Karl von Fritsch, University of Graz, The language of the bees.

983rd Meeting—May 14, 1949

70TH ANNUAL MEETING

President Aldrich in the chair; 20 persons present.

New members elected: Ross H. Arnett, Kenneth C. Parks, William O. Pruitt, Mrs. Anastasia J. Romanoff.

Reports were presented by the Recording Secretary, Treasurer, Committee on Publications, and Committee on Communications.

The following officers and members of council were elected:

President, F. C. Lincoln; *Vice Presidents*, J. E. Bendict, Jr., W. A. Dayton, H. G. Deignan, Hugh O'Neill; *Recording Secretary*, S. F. Blake; *Corresponding Secretary*, D. H. Johnson; *Treasurer*, A. J. Duvall; *Members of the Council*, Harry A. Borthwick, Malcolm Davis, H. J. Deason, Lloyd W. Swift, Wm. Stickel.

The business meeting was followed by an open meeting, at which the records of frog and toad voices, prepared by A. A. Allen of Cornell University and sold under the title *Voices of the Night*, were played on the phonograph.

Special Meeting—June 6, 1949

Joint meeting with the Society for Parapsychology, Washington section.

Formal Communication: F. C. Lincoln, The homing instinct in birds.

984th Meeting—October 6, 1949

Joint meeting with the Washington Academy of Sciences and the Entomological Society of Washington.

Formal Communication: H. H. Stage, Observations of an entomologist in Africa and Mauritius; Nagana, African sleeping sickness of animals (sound film).

985th Meeting—November 12, 1949

President Lincoln in the Chair; 31 persons present.

New member elected: Abelardo Moreno.

Formal Communication: Lionel A. Walford, Sardines; It's the Maine sardine (color film).

986th Meeting—December 10, 1949

President Lincoln in the Chair; 43 persons present.

New members elected: Robert Rausch, Kenneth E. Stager.

Informal Communications: Clarence Cottam, Note on damage done by squirrels to lead pipe used to protect telephone wire; Malcolm Davis, Note on a turkey buzzard snatching a frankfurter from a small boy at the Zoo and eating it.

Formal Communication: Clarence Cottam, Conservation in New Zealand.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW NAME FOR THE GENOTYPE OF *WALCHIA*
EWING (ACARINA: TROMBICULIDAE)

By HENRY S. FULLER

Trombidium glabrum Dugès dates from January, 1834, Annales des Sciences Naturelles, Seconde Série, Zoologie, 1, pp. 39-40. The description validates the name, but it is not adequate for recognition of the mite according to current standards.

Trombidium glabrum Walch dates from 1927, Geneeskundig Tijdschrift voor Nederlandsch-Indië, 67, pp. 924, 926-927, 932; table I; figs. 4-6. It was made the type of *Walchia* Ewing by original designation (Proc. U.S. Nat. Mus., 80, no. 2908, Art. 8, pp. 10-11). In mentioning the genotype, Ewing incorrectly referred its original description to the genus *Trombicula*, a combination not used by Walch.

Since *Trombidium glabrum* Walch is preoccupied, it is rejected as a homonym, and the writer hereby proposes for it

Trombidium ewingi nomen novum

The genus *Walchia* Ewing contains the following named species: *Walchia ewingi* nomen novum, genotype; of which *W. pingue* Gater, 1932, is a synonym, according to Womersley and Heaslip (1943); *W. enode* Gater, 1932; *lewtharaitei* Gater 1932; *W. rustica* (Gater, 1932); *W. turmalis* (Gater, 1932); *W. disparunguis* (Oudemans, 1929); *W. morobensis* Gunther, 1939; and *W. americana* Ewing, 1942.

This paper is a byproduct of a revisionary study done during the period of tenure of a John Simon Guggenheim Memorial Fellowship.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW GENUS AND FOUR NEW SPECIES IN THE
DIPLOPOD FAMILY XYSTODESMIDAE

By RALPH V. CHAMBERLIN

The types of the new forms here described are in the writer's collection at the University of Utah.

Genus *Cherokia* new

Characterized by the structure of the gonopods of the male. In this the telopodite extends forward nearly at right angles to the coxa and is distinctly divided into two segments of which the first is straight; the second division a blade that is distally furcate, with its terminal branch bidentate at tip. (See accompanying figure 1.) Generotype.—*Cherokia georgiana* (Bollman).

While Bollman's *Fontaria georgiana* was previously placed by the present writer in the genus *Mimuloria*, it is now set apart because of the distinctly divided telopodite of the male gonopods, a feature that also distinguishes it from *Rhysodesmus* and other related genera.

Sigmoria zyga new species

Field notes record that in life this species has the caudal and lateral borders of the tergites red, with the edges white. In alcohol the red color fades out. The species is best distinguished by the form of the telopodite of the male gonopods, especially at its distal end which is prolonged into a slender curved process as represented in fig. 2.

Length, 35 mm.; width, 9 mm.

Locality: North Carolina, between Hot Springs and Paint Rock. Two ♂s and one ♀ taken Aug. 7, 1910 by R. V. Chamberlin.

Dynoria medialis new species

In the preserved holotype the anterior part of the exposed portion of the tergites is chestnut while the keels and a broad band across caudal border are yellow; legs yellow.

Coxae of legs and sternites of middle and posterior segments with conical processes or spines.

Gonopods of ♂ of same general form as those of *icana*; the telopodite lamellate, with a narrower proximal stem above which the blade expands as shown in the figures (Figs. 5 & 6). The supplementary process at the distal end closely applied to the main body, not widely divergent as it is in *icana*.

Length, about 45 mm.; width, 11 mm.

Locality.—Georgia: Atlanta. Male holotype taken July 12, 1946 by P. W. Fattig.

Nannaria cayugae new species

This small form has the keels and a stripe across caudal border of tergites yellow in color, with remaining portion nearly black but lighter each side of middle, this giving appearance of two somewhat lighter longitudinal stripes. Legs light brown or yellow; antennae dark, nearly black, distally.

Coxae all unspined. Posterior sternite with a pair of subconical processes or teeth at posterior border. Processes of coxae of second legs in male cylindrical, relatively short and stout, distally truncate.

Blade of gonopods of male moderately evenly curved, apically narrowed; with basal spine elongate, curved toward base, the distal portion more nearly straight. (See fig. 3).

Width, 4 mm.

Locality: New York: Ithaca. One male taken in the summer of 1930.

Nannaria equalis new species

Dorsum black or in part deep chestnut excepting the keels, these being yellow; the sides also yellowish. Legs light brown, the antennae darker.

Pores lateral in position as usual in the genus.

Distinguished from other known species in peculiarities of the male gonopods. In these the main branch is straight excepting a short apical portion which is bent at right angles to the main axis. The basal spine nearly equals in length the telopodite proper and is a little clavately expanded distally. See further fig. 4.

Width of ♂ holotype 5.2 mm.

Locality.—Tennessee: Knoxville. A male and female.

The female allotype is not in full color.

Nannaria castanea (McNeill)

Polydesmus castaneus McNeill, 1887, Proc. U.S. Nat. Mus., 10:329, pl. 12, fig. 8.

Fontaria castanea Bollman, 1893, Bull. U.S. Nat. Mus., No. 46, p. 123.

Mimularia castanea Chamberlin, 1928, Ent. News, 39:153.

Fontaria castanea Williams & Hefner, 1928, Bull. Ohio Biol. Survey, No. 18:106, fig. 9B.

Nannaria ohionis Loomis & Hoffman, Proc. Biol. Soc. Wash., 61:53.

Localities: Indiana and Ohio.

Loomis and Hoffman state (loc. cit.) that the form figured by Williams and Hefner "is distinctive in the subterminal tooth on the mesial process" of the ♂ gonopod. However, McNeill in his original description gives a figure of the gonopod in which this characteristic tooth is plainly represented and it is present in all specimens from Indiana and Ohio. It seems obvious, therefore, that *ohionis* is typical *castanea*.

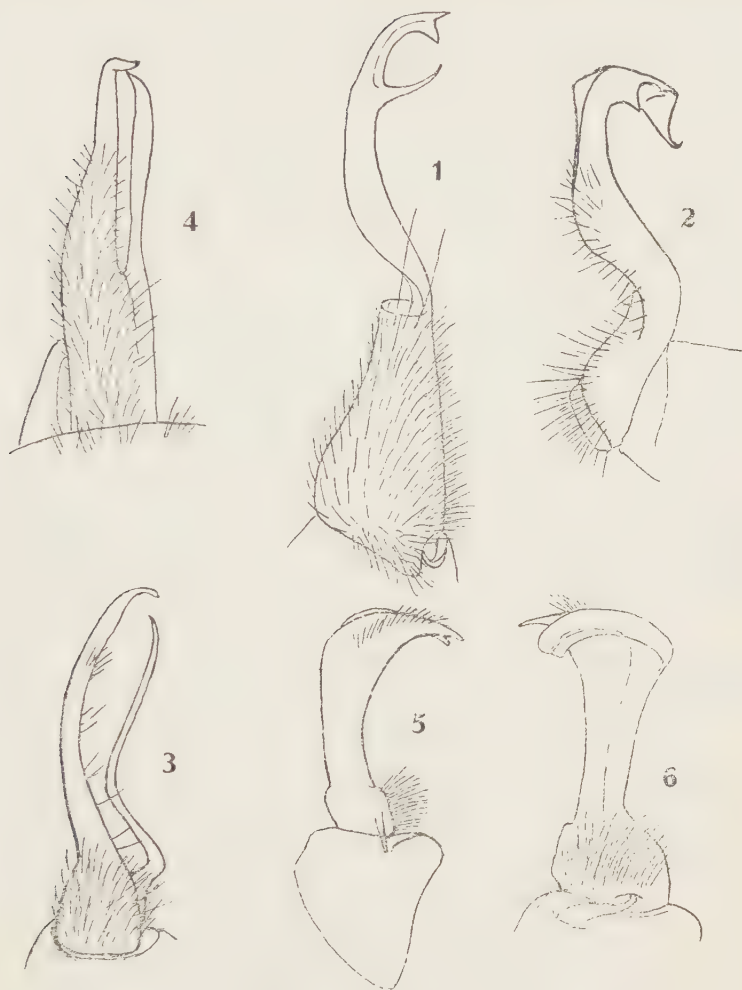
Nannaria tuobita (Chamberlin)

Fontaria tuobita (Chamberlin), 1910, Ann. Ent. Soc. America, 3:243, Pl. 25:7, 8.

Nannaria ursula Chamberlin, 1938, Proc. Biol. Soc. Wash., 51:207.

Localities: New Mexico: Clouderoft, Bear Canyon, Ruidosa, Glencoe, Fort Stanton, etc.

While varying considerably in size and coloration, there is complete intergradation between the extreme forms.



Explanation of Figures on Plate I.

- Fig. 1. *Cherokia georgiana* (Bollman). Right gonopod of male, subventral view.
 Fig. 2. *Sigmoria zyga* new species. Gonopod of male, subventral view.
 Fig. 3. *Nannaria cayugae* new species. Right gonopod of male, submesal view.
 Fig. 4. *Nannaria equalis* new species. Right gonopod of male, mesoventral view.
 Fig. 5. *Dynoria medialis* new species. Left gonopod of male, ventral view.
 Fig. 6. *Dynoria medialis* new species. Left gonopod of male, submesal view.

PROCEEDINGS
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A NEW FAMILY IN THE DIPLOPOD ORDER
CHORDEUMIDA

By RALPH V. CHAMBERLIN

Among a number of diplopods collected by Stanley and Dorothea Mulaik, presumably in Texas near Kerrville are a female and two males representing a new genus and a distinctly new family in the suborder Chordeumidea of the order Chordeumida. Pertinent diagnoses are herein given.

Family *Ergethidae* new

Body composed of 20 segments. Mentum of the gnathochilarium entire, no promentum being set off; prebasilar sclerite complete, sclerotized entirely across with but very narrow at middle. Ocelli 17 on each side. Second legs of seventh segment in the male not at all modified.

Containing the new genus *Ergethus*.

Readily distinguished from other families in having the body composed of only 20 segments as well as in the characters of the gnathochilarium as noted above.

Genus *Ergethus* new

With the characters of the family as noted above. Antennae long; first article very short, the second and third long and subequal; the fourth, fifth and sixth somewhat shorter, subequal. Telopodite of gonopods of male curved, distally broad and rather complicated. Second legs of the seventh segment of normal form and size. Surface of tergites smooth.

Generotype—*Ergethus perditus* new species.

Ergethus perditus new species

Body attenuated anteriorly and more abruptly posteriorly. Surface of segments smooth, with the segmental sulci fine and distinct. Last tergite with narrowed cauda projecting well beyond the caudal valves. Legs and antennae long.

Body in general brown, paler beneath and in more or less distinct annuli. Legs yellow.

Head depressed behind base of antenna on each side, the ocellus in the depression; retose, the setae longer and more dense in frontal and clypeal region; a fine median sceleus across vertex and down to a point between antennae above which interrupted.

Gnathochilarium with mentum subtriangular in outline, the acute apex extending between the *lamellae linguales*.

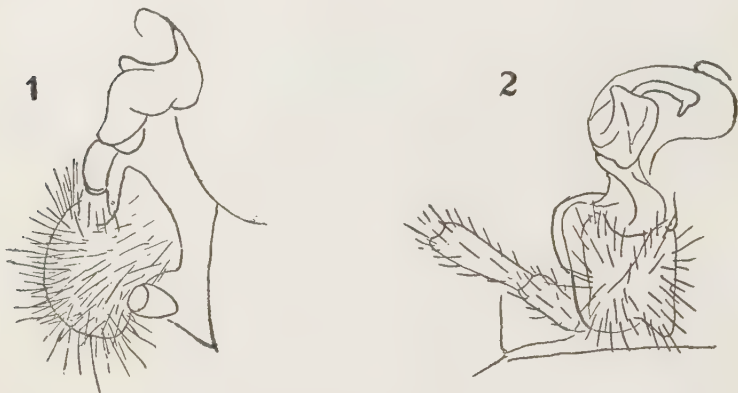
Collum moderately narrowed down each side; the lower margin nearly straight and the corners rounded, the caudal one more widely so.

Legs long and slender with the ultimate article considerably longer than the penult.

Gonopods of male are represented in figs. 1 and 2.

Length of ♂ holotype about 10.5 mm.; of ♀ allotype, about 12 mm.

Locality: Texas: near Kerrville (?). One female and three males taken in the summer of 1939 by Stanley and Dorothea Mulaik.



Explanation of Figures

Fig. 1. Left gonopod of male, ectal view.

Fig. 2. Right gonopod of male, ventral view.

PROCEEDINGS
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A NEW RACE OF THE SOUTHERN INDIAN GREEN
PIGEON

By S. DILLON RIPLEY

Through the kindness of Mr. W. W. A. Phillips, the authority on Ceylon birds and mammals, I have had an opportunity of examining specimens of the Southern Indian Green Pigeon recently secured by him in Ceylon. Mr. Phillips first came on this species in January, 1947 in the forests of Uva Province near Bibile, southeast Ceylon. His note on the occurrence was published in the Journal of the Bombay Natural History Society (47, No. 1, 1947, p. 162.). His record of these pigeons, which have been considered to be rare vagrants, is the first since that of Legge over 60 years ago. Later, specimens have been secured in September, November and February, some in breeding condition. Comparison of these birds with a series from South India reveals at once the presence of a new form which I propose as follows;

Treron phoenicoptera phillipsi subsp. nov.

Type.—♂ ad. (coll. S. Dillon Ripley No. 1801. Type on deposit in the Peabody Museum of Nat. Hist.), collected February 26, 1948, by W. W. A. Phillips at Nilgala near Bibile, Uva Province, S. E. Ceylon.

Diagnosis.—from *chlorigaster* of southern India this race differs by being smaller and by being duller yellow on the nape, more greenish, and duller, more grayish-green on the back and wings: below these birds lack the lemon yellow neck and breast. The yellow is confined to a sub mental spot and to a patch about the vent and thighs. The breast and abdomen are dull greenish yellow, more infused with grayish-green than in *chlorigaster*. The vinous shoulder patch also is duller and slightly darker than in *chlorigaster*. The measurements follow;

		wing	tail	culmen
<i>phillipsi</i>	4 ♂ ♂	163, 165, 167,	97 (type), 98,	18, 18.5 (type)
		167 (type)	98, 100	
	4 ♀ ♀	160, 162, 165.5,	95, 97.5, 99,	17, 17.5
		169	104	
<i>chlorigaster</i>	4 ♂ ♂	186-193	103-117	18.5-19.5
	4 ♀ ♀	173-189	103.5-113	19-20

Range.—Ceylon, so far found only in Uva Province in the southeast of the Island.

Remarks.—It gives me great pleasure to name this form for my friend who has helped me so much in connection with my studies of Ceylon birds. Mr. Phillips has recently sent me the following notes;

1) color of soft parts; "iris (both sexes), inner ring blue, outer carmine; eyelids bluish gray; bill pale bluish white; legs chrome yellow."

2) notes on occurrence; "In general this Pigeon appears to behave in similar manner to other Green Pigeons. It keeps chiefly to the tops of trees, and normally does not descend to the ground. During the winter period it collects in flocks and feeds on any berries and figs that may happen to be ripe. As they fly these Pigeons may be distinguished by the noise of their wings. A male shot Sept. 23rd was with two or three others and a number of Pompador Green Pigeons feeding in a *Ficus*. I now think that this Pigeon must be resident in the Bibile jungles as, had the one shot this day been a migrant, it would most probably have been with a flock—also Northeast Monsoon migrants are only just beginning to come in. The gonads of the present bird were fairly well developed. Other specimens collected in late February also had the gonads enlarged. In addition to figs these birds were found feeding on the berries of *Vitex altissima*, called locally "milla." This bird probably breeds during March and April."

I am much indebted to Mr. J. D. Macdonald of the British Museum for measurements of a number of specimens of this form in the BM collection.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

GENERIC NAMES OF THE FOUR-EYED POUCH
OPOSSUM AND THE WOOLLY OPOSSUM (*Didelphidae*)

By PHILIP HERSHKOVITZ

Published opinions on the status of *Philander* Tiedemann (Zoologie, vol. 1, p. 426, 1808) are not convincing for lack of evidence that the work cited had been carefully studied or even consulted. Tiedemann's system of classification is Linnaean with names for all hierarchies recognized (orders, families, genera, species) properly proposed and, for his time, adequately diagnosed. The following abstract from the "Zoologie" exposes the nature of the name *Philander*.

p. 426]

Geschlecht 1.

Opossum. *Philander* (*Didelphys* L.)

(Sarigue)

[Generic description follows]

p. 427]

[Description continued]

Es gibt gegen 10 bekannten Arten:

- 1) Das Virginische Opossum. *P. virginianus* (Did. opossum L.)
(le sarigue Buff. T. X. p. 279.)

Körper röthlich braun. Ueber jedem Auge ein gelblich weiser Flecken. Schwanz so lang als der Leib.

1 Fuss und 3 Zoll lang ohne den Schwanz.

In Virginien, Mexico, Peru u. s. w.

Schreb. tab. 146, A. B.

Edw. Tyson Carigüeya seu marsupiale Americanum or the anatomy of an opossum. Philos. Transact. V. 1698. p. 105, V. 1704, p. 1576.

William Cowper an account of the anatomy of those parts of a male opossum that differ from the female. Ibid. V. 1704. p. 1576.

- 2) Das mausartige Opossum *P. murinus* (Did. murina L.) (la marmose Buff. T. X. p. 335.)

p. 428]

[Specific description follows]

- 3) Das kurzgeschwänzte Opossum. *P. brachyurus* (Did. brachyuros Penn.) (le touan Cuvier Tabl. Element. d'hist. nat. p. 125.)

[Specific description follows]

The above three species are all that were included in the genus *Philander*. It is perfectly clear from the description and the references to Buffon, Linnaeus and Schreber, that the first species *P. virginianus* is merely a new name for the four-eyed pouch opossum, *Didelphis opossum* Linnaeus. The second species is a *Marmosa*, the third a *Monodelphis*. As *P. virginianus* is virtually tautonymic, it is here designated

genotype of *Philander* Tiedemann. Designation of the woolly opossum, *Didelphis philander* Linnaeus, as genotype by Thomas (Catalogue of the Marsupialia and Monotremata in the collection of the British Museum, p. 336, 1888) is untenable. In reality, the *Philander* of Thomas and subsequent authors is the homonym *Philander* Burmeister 1856, with type *Didelphis philander* Linnaeus.

Arguments presented by Allen (Bull. Amer. Mus. Nat. Hist., vol. 13, pp. 188-189, 1900) against usage of *Philander* Tiedemann stem from a misunderstanding of the original composition of the genus and are not relevant. Nevertheless, Allen's substitution of his own *Caluromys* (*D. philander* Linnaeus type) for *Philander* authors (not Tiedemann), is accidentally valid. Tate's (*Ibid.*, vol. 76, p. 164, 1939) rejection of *Philander* Tiedemann is based primarily on the misidentification of *P. virginianus* as a *Didelphis*, and secondarily on the "homonymity" with *Philander* Brisson, 1762. This last in spite of the fact that Tate (*op. cit.* p. 161) listed *Philander* Brisson as an unavailable synonym of *Metachirops* Matschie! With all due respect for Tate's doubtful endorsement, Brisson's system of classification is non-Linnaean and merits no consideration. Furthermore, it already has been shown by Hopwood (Proc. Zool. Soc. London, vol. 117, p. 533, 1947), that Brisson's generic names are pre-Linnaean and unavailable in any case. Hopwood (*op. cit.* p. 535) erred, however, in naming "*Didelphys philander* Linnaeus" the genotype of *Philander* Tiedemann. In addition, he disinterred *Philander* Gronovius, 1763, with the same genotype designated. Names by Gronovius are no better than those of Brisson and need not be revived at this late date (*cf.* Opinion 89, International Commission on Zoological Nomenclature).

To avoid the possibility of future confusion, disposition must be made of two other and unused generic names each with several species including those under discussion. Genotype of *Gamba* Liais (Climats, geol. faune et geogr. bot. Bresil, p. 329, 1872) is here designated *Gamba palmata* Liais (= *Chironectes minimus* Zimmermann); genotype of *Cuica* Liais (*loc. cit.*) is here designated *Cuica murina* Liais (= *Marmosa murina* Linnaeus).

Pertinent data presented are summarized in the following synonymies, Genus *Philander* Tiedemann (Four-eyed pouch opossums).

Philander Tiedemann, Zoologie, vol. 1, p. 426, 1808 (genotype, *P[hilander] virginianus* Tiedemann = *Didelphis opossum* Linnaeus).

Metachirops Matschie, Sitz-ber. Gessellsch. naturforsch. Fr. Berlin, p. 268, 1916 (genotype, *Didelphis opossum* Linnaeus).

Holothylax Cabrera, Genera Mammalium, (Monotremata, Marsupialia), Mus. Nac. Cien. Nat., Madrid, p. 47, 1919 (genotype, *Didelphis opossum* Linnaeus).

Genus *Caluromys* Allen (Woolly opossums).

Philander Burmeister, Erläuterungen Fauna Brasiliens, p. 74, Berlin 1856 (genotype, *Philander cayopollin* Burmeister = *Didelphis philander* Linnaeus; homonym of *Philander* Tiedemann, 1808).

Caluromys Allen, Bull. Amer. Mus. Nat. Hist., vol. 13, p. 189, 1900 (genotype, *Didelphis philander* Linnaeus).

Micoureus Matschie, Sitz-ber. Gesellsch. naturforsch. Fr. Berlin, pp. 259, 269 (genotype, *Didelphis laniger* Desmarest = *D. lanata* Olfers; homonym of *Micoureus* Lesson, 1842).

Mallodelphys Thomas, Ann. Mag. Nat. Hist., ser. 9, vol. 5, p. 195, 1920 (substitute name for *Micoureus* Matschie).

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TECHNICAL NAMES OF THE AFRICAN MUIHOND
(GENUS *ZORILLA*) AND THE COLOMBIAN HOG-
NOSED SKUNK (GENUS *CONEPATUS*)

By PHILIP HERSHKOVITZ

Application of the typical specific name for the Cape Stinkmuishond or Striped Polecat is embroiled with names erroneously applied to neo-tropical hog-nosed skunks. The Cape Stinkmuishond, currently listed as *Ictonyx striatus* Perry (cf. G. M. Allen, Bul. Mus. Comp. Zool., vol. 83, p. 179, 1939) is identical with the *zorille* described and figured by Buffon in 1755 (Hist. Nat., vol. 13, p. 289, 302-303, pl. 41 [misnumbered 29]). Unfortunately, Buffon believed that the animal originated in the New World. This led some authors to compare and even to identify the *zorille* with the South American *mapurito* or *mafutiliqui* mentioned by Gumilla (El Orinoko ilustrado y defendido, vol. 2, p. 276, 1745; Hist. nat., civ. et geogr. l'Orenoque, vol. 8, p. 240, 1758). These blunders were corrected by Cuvier in 1801 (in Azara, Essais Hist. Nat. Quad. Paraguay, French transl., vol. 1, p. 239, footnote a) and in several later works. Cuvier showed that Buffon's *zorille*, which he termed *Viverra zoralla* Linnaeus (Gmelin), is a native of the Cape of Good Hope and not related to any American or European mustelid. This correction was sustained until Lichtenstein laboriously attempted to identify the *zorille* with a representative of the North American genus *Spilogale*! A. H. Howell, in revising the genus (North American Fauna No. 26, p. 11-12, 1906) was inclined to follow suit but prudently rejected the name for any known form of *Spilogale*. The white edged ears and the extensively whitened tail of the *zorille*, clearly figured by Buffon and others (Schreber, Shaw, etc.) are diagnostic of the Cape Stinkmuishond and positively eliminate from consideration all American mustelids.

Of numerous technical names applied to the *zorille* or Cape Stinkmuishond, the earliest, based solely on Buffon's reference, is *Viverra mapurito* Müller, 1776.

It has already been shown (A. H. Howell, Proc. Biol. Soc. Washington, vol. 19, p. 46, 1906; Hershkovitz, in press, Journ. Mamm., vol. 30, 1949)

that Oken's vernacular term "zorille" cannot be used as the generic name for the African polecats. *Ictonyx* Kaup, 1835, proposed as a substitute, is antedated by *Zorilla* I. Geoffroy, 1826 (Dict. Class. Hist. Nat., Paris, vol. 10, p. 215, type by monotypy "Le Zorille, Buff., T. XIII, pl. 41; *Mustela Zorilla* et *Viverra Zorilla* des auteurs systématiques" = *Viverra mapurito* Müller). Originally proposed as a subgenus of *Mustela*, *Zorilla* was raised to generic rank by Cuvier (Dict. Sci. Nat., p. 449, 1829). Accordingly, the scientific name for the zorille or Cape Stinkmushond, stands as follows, with the partial synonymy included as a supplement to the references given above and by G. M. Allen (*op. cit.*).

Zorilla mapurito Müller

Viverra mapurito Müller, Linn. Syst. Nat., Suppl., p. 32, 1776.

Viverra zorilla Schreber, Säugth., Theil 3, p. 445 (description), pl. 123 (name), 1777.

[*Viverra*] *zorilla* Erxleben, Syst. Reg. Anim., p. 492, 1777. Shaw, General Zoology, vol. 1, pt. 2, p. 391, pl. 94 (top fig.), 1800 (part; ref. to Schreber and Buffon). Gmelin, Linn. Syst. Nat., ed. 13, vol. 1, p. 88, 1788 (part).

[*Viverra*] *zorille* Boddaert, Elenchus Animalium, p. 84, 1784.

Mustela zorilla, Lacépède, Buffon Hist. Nat., ed. Didot, vol. 13, p. 163, 1799. Desmarest, Mammalogie, p. 181, Atlas pl. 86, fig. 4, 1820 [1821].

Ictonyx striatus striatus, G. M. Allen, Bull. Mus. Comp. Zool., vol. 83, p. 179, 1939 (synonymy).

Type locality.—None given in original description; determined by Cuvier, *sup. cit.*) as Cape of Good Hope, South Africa.

The named forms of the species include: *Zorilla mapurito albescens* Heller, *Z. m. elgonis* Granvik, *Z. m. erythrae* De Winton, *Z. m. intermedius* Anderson and De Winton, *Z. m. lancasteri* Roberts, *Z. m. maximus* Roberts, *Z. m. obscuratus* de Beaux, *Z. m. pondoensis* Roberts, *Z. m. senegalenensis* Fischer, *Z. m. shoa* Thomas, *Z. m. sudanicus* Thomas and Hinton.

Shortridge (The Mammals of South West Africa, vol. 1, p. 197, 1934), regards *limpopoensis* Roberts and *shortridgei* Roberts as identical with the typical form.

The Colombian Hog-Nosed Skunk

Notwithstanding published allegations to the contrary, the only basis for the name *Viverra mapurito* Gmelin, is a Colombian and not a Mexican hog-nosed skunk. This name, as shown above, is preoccupied and cannot be used for any New World mustelid. The first scientific description of the Colombian hog-nosed skunk is due to the celebrated naturalist and eminent botanist, José Celestino Mutis. This scholar, born in 1732, in Cadiz, Spain, sailed for Cartagena, Colombia, in 1760. Until his death in Bogotá, in the year 1808, Mutis devoted himself to the study of the natural phenomena of Colombia. It was during a four year expedition to Las Minas de Mantuosa, near Pamplona, Norte de Santander, Colombia, that Mutis discovered the animal in question. A complete description of the skunk under the misnomer "*Viverra putorius*," was addressed October 6, 1767 to a Swedish friend, Alströmer, who secured its publication in 1770 (Kongl. Vetenskap. Acad. Handl., Stockholm,

vol. 31, p. 67-77). In 1771, Linnaeus included in the *Mantissa* (2, p. 522) a Latin summary of the original description still under the name "*Viverra putorius*." Schreber (*Säugeth.*, Theil 3, heft 26, p. 445-6, 1777) gave a German translation of the description and introduced the Spanish vernacular name *mapurito*. Schreber continued the use of the misnomer "*Viverra putorius*," however, and, through a *lapsus*, assigned both the type locality, Pamplona, and the residence of Mutis, Santa Fé (= Bogotá), to "Mexico." In 1784, Boddaert (*Elenchus Animalium*, p. 84) disengaged Mutis' skunk from the synonymy of *Viverra putorius* Linnaeus, a *Spilogale*, and designated it *Viverra semistriata*. Unhappily, this author carelessly followed Schreber in citing "Mexico" as the habitat. The same error was repeated later by Gmelin (*Linn. Syst. Nat.*, ed. 13, vol. 1, p. 88, 1788) who proposed the preoccupied name *Viverra mapurito* as a substitute for "*Viverra putorius* Mutis." Humboldt (*Rec. Obs. Zool. Anat. Comp.*, vol. 1, p. 350, 1811 [1812] who with Bonpland (*vide Ann. Mus. Hist. Nat.*, Paris, vol. 4, p. 476-477, 1804) became acquainted with Mutis and his collections in Bogotá, recognized and redefined the Colombian skunk under the name *Viverra mapurito* Gmelin. At the same time, Humboldt reasserted the Colombian origin of the type specimen and recorded additional Colombian (*Fusagasugá*; Santa Fé de Bogotá) and Ecuadorian (*Loja*) localities for the species. Another specimen from Quito, Ecuador, was regarded as distinct and named *Gulo quitensis*.

The foregoing historical facts are summarized in the following synonymy. A few collateral references are included for dissipating any confusion still remaining in certain quarters.

Conceptaus semistriatus Boddaert

- Viverra putorius* Mutis (*nec* Linnaeus, 1758) *Kongl. Vetenskap. Acad. Handl.*, Sweden, vol. 31, p. 66-67, 1770. Linnaeus, *Mantissa*, 2 appendix p. 522, 1771. Müller, *Linn. Syst. Nat.*, Suppl., p. 31, 1776. Schreber, *Säugeth.*, Theil 3, heft 26, p. 445-446, 1777 ("Der Mapurito," Mexico!).
- [*Viverra*] *semistriata* Boddaert, *Elenchus Animalium*, p. 84, 1784 [1785] (based solely on reference to Mutis, 1769 [1770]).
- [*Viverra*] *mapurito* Gmelin (*nec* Müller, 1776), *Linn. Syst. Nat.*, ed. 13, vol. 1, p. 88, 1788 (based solely on reference to Mutis).
- Mephitis* *mapurito*, Lichtenstein, *Abh. k. Akad. Wiss. Berlin, phys. Kl.*, 1836, p. 270, 1838 (Colombia).
- [*Viverra*] *conepatl* Gmelin, *Linn. Syst. Nat.*, ed. 13, vol. 1, p. 88, 1788 (based solely on "conepatl . . . Hernand[ez], Mex[ico], p. 232," 1651).
- Gulo quitensis* Humboldt, *Rec. Obs. Zool. Anat. Comp.*, vol. 1, p. 347, 1811 [1812] (type locality, Quito, Ecuador).
- Mephitis zorilla* Fischer, *Synopsis Mammalium*, p. 162, 1829 (based solely on the "mapurito" of Gumilla; type locality, Río Orinoco, Venezuela).
- Mephitis* *gumillae* Lichtenstein, *Abh. k. Akad. Wiss. Berlin, phys. Kl.*, 1836, p. 276, 1838 (based solely on reference to the "mapurito" of Gumilla; name antedated by *zorilla* Fischer).
- Mephitis* *amazonica* Lichtenstein, *Abh. k. Akad. Wiss. Berlin, phys. Kl.*, 1836, p. 275, 1838 (type locality, Rio Amazonas; collected by Mawe, British Museum).

Conepatus semistriatus, A. H. Howell, Proc. Biol. Soc., Washington, vol. 19, p. 45, 1906. Cabrera and Yepes, Mamíferos sud-americanos, Historia Natural Ediar, p. 154, 1940 (Colombia and Venezuela).
Type locality.—Las Minas de Mantuosa, near Pamplona, Norte de Santander, Colombia.

BIOLOGICAL SOCIETY OF WASHINGTON
OF THE
PROCEEDINGS

A NEW CRAYFISH OF THE GENUS *ORCONECTES*
FROM THE NASHVILLE BASIN IN TENNESSEE,
WITH NOTES ON THE RANGE OF *ORCONECTES*
COMPRESSUS (FAXON) (DECAPODA, ASTACIDAE)

By HORTON H. HOBBS, JR.¹

Apparently the first specimens of the new species described below were collected by Mr. J. E. Benedict at Nashville, Tennessee, in May, 1897. Faxon (1914:383) mistakenly identified them as *Orconectes validus*. Fleming (1939), in his report on "The Larger Crustacea of the Nashville Region," was apparently unaware of Faxon's record for *Orconectes validus*, and he included no reference to a form which can be ascribed to this species. It is possible that the range of this new species is somewhat restricted in the Nashville area; however, Dr. C. S. Shoup of Vanderbilt University, and Dr. Mike Wright of Tusculum College have collected it in several localities (see below) south of Nashville.

The Virilis section of the genus *Orconectes*, of which this species is a member, has a rather large range in the central part of the United States; however, only one member of this assemblage has been previously reported from the Cumberland River drainage. In "The Crayfishes of Kentucky. . ." Rhoades (1944:133) recorded *Orconectes compressus* (Faxon 1884:127) from the lower Cumberland drainage in Kentucky, but it is not known to occur in tributaries above the mouth of Little River in Kentucky.

Since in my collection there are several new locality records for *Orconectes compressus*, I am including them below with a brief summary of the present knowledge of this species.

Genus *Orconectes* Cope 1872

Orconectes compressus (Faxon)

Cambarus compressus Faxon, Proc. Amer. Acad. Arts and Sci. 20:127, 1884.

Faxon 1884: 124, 127-128, 146; Faxon 1885a: 85, 86, 102, 105-107, 161, 167, 174, 178, Pl. V, fig. 6, Pl. X, figs. 2, 2', 2a, 2a'; Faxon 1885b: 359; Faxon 1914: 419; Fleming 1939: 306; Goodnight 1940a: 222-223; Goodnight 1940b: 170; Harris 1903: 60, 83, 146, 151; Hay 1899: 960, 962; Ortmann 1902: 278; Ortmann 1905: 110, 112, 127; Ortmann 1931: 90, 94, 95.

Orconectes compressus Hobbs 1942: 352 (by implication); Rhoades 1944: 113, 133, 134.

¹Miller School of Biology, University of Virginia.

In the bibliography above only three papers make any contribution to the distribution or ecology of *O. compressus*. In the original description Faxon (1884:128) gives two locality records, but ecological notes are wanting. No new information was published until Goodnight (1940) gave an account of the rediscovery of *O. compressus* in Mississippi. The third contribution was that of Rhoades (1944) who recorded this species from several counties in Kentucky and noted observations he had made on its habits.

Range.—Tributaries of the Tennessee River in Alabama, Mississippi and Tennessee; tributaries of the Cumberland River in Tennessee and Kentucky; and tributaries of the Barren River in Tennessee and Kentucky.

ALABAMA

Lauderdale County—Tennessee drainage.

1. ²Second Creek, Waterloo (Type Locality)—Faxon 1884:128.
2. ²Cyprus (sic.) Creek—Faxon 1884:128.
3. Second Creek, Waterloo (1 ♂ I, 1 ♀)—L. Stewart, collector, December 7, 1938.
4. Cypress Creek, 3 miles north of Florence (4 ♂ ♂ II, 12 ♀ ♀)—L. J. Marchand, collector, June 8, 1941.

Limestone County—Tennessee drainage.

5. Six miles east of Athens, U. S. Hy. 72 (1 ♂ II)—L. J. Marchand, collector, June 8, 1941.

KENTUCKY (Rhoades 1944:133) No localities were cited.

6. *Barren County*—Barren River to Ohio River.
7. *Simpson County*—Barren River to Ohio River.
8. *Allen County*—Barren River to Ohio River.
9. *Warren County*—Barren River to Ohio River.
10. *Trigg County*—Little River to Cumberland River.

MISSISSIPPI

Tishomingo County—Tennessee drainage.

11. “. . . small stream between Iuka, Mississippi and the Alabama border near U. S. Route 72” (10 ♂ ♂ II, 12 ♀ ♀)—C. J. Goodnight (1940:222), collector, August 22, 1939.

TENNESSEE

Clay County—Barren River to Ohio River.

12. Big Trace Creek, Hermitage Springs (8 ♂ ♂ II, 1 ♀)—C. S. Shoup, Mike Wright, and H. H. Hobbs, collectors, April 29, 1945.

Maury County—Duck River to Tennessee River.

13. Creek near Mt. Pleasant (2 ♂ ♂ II, 1 ♀)—Fred Campbell, collector, Summer 1945.

Ecology.—The first ecological notes published on *O. compressus* were those of Goodnight. In describing the Mississippi locality cited above he stated “The crayfishes were found in a small rocky stream with a bed of pebbles and sand. The water was clear and cold, apparently spring fed. This observation would tend to indicate that this species is an inhabitant of the clear cold streams of the hills of the area. When disturbed the crayfishes hid by crouching on the bottom of the creek. Their brown color made them very difficult to detect against the stream

²From the two localities C. L. Herrick collected 18 ♂ ♂ I, 2 ♂ ♂ II, and 19 ♀ ♀, in October, 1882.

bottom. . . This species is extremely fast and agile in its movements." Goodnight (1940:222).

According to Rhoades, *Orconectes compressus* "is a common species of the lower Tennessee and tributaries" (1944:133); however, he cites no records except those of Faxon and Goodnight. Further, he states that this "species has crossed the drainage divide between the Cumberland and Barren rivers. The species is common to abundant throughout the Barren River drainage" (ibid.). Since this species has not been found in the upper Cumberland I judge that Rhoades is postulating the crossing of the divide in Kentucky. With reference to the habits of *compressus* in Kentucky he points out that specimens are "easily mistaken for immatures of associated species in seined collections and their color blends so perfectly with the gravelly stream beds that they are difficult to detect for hand collecting. These characters combined with their habit of remaining motionless on the bottom when disturbed may account to some extent for the obscurity of the species" (ibid.).

Cypress Creek is a rock and gravel bottomed, clear, swift stream some 20-60 feet wide with occasional deep holes having muddy bottoms. In writing to me about *O. compressus* in this locality Mr. Marchand stated that they "live in holes in the gravel along edges of quiet shallow pools." About the locality near Athens, he described the creek as a "small, rocky-bottomed creek with a good flow of clear water."

Big Trace Creek at Hermitage Springs where I collected was a very swift, clear, rock and gravel bottomed stream and some three feet deep in the deepest place. The water was so swift at the time I collected there that when I waded in over two feet it was difficult to stand. Here the crayfish had apparently scooped out shallow burrows under the larger pebbles and stone, and when these stones were turned the crayfish in most instances remained perfectly still until further molested, whereupon they swam away with amazing rapidity. Whereas most of the specimens which escaped my net took advantage of the strong current and went down-stream, a number of them demonstrated their swimming ability by making fairly good headway for short distances upstream.

Thus it seems probable that this species is associated with clear, rock or gravel bottomed streams, and the widely scattered localities suggested a rather widespread distribution in Tennessee.

The morphological differences which exist between the specimens which I have examined are negligible.

Orconectes rhoadesi,³ sp. nov.

Cambarus validus Faxon, Mem. Mus. Comp. Zool., Harvard Coll., 40 (8): 383, 1914, (in part). Ortmann, Ann. Carnegie Mus., 20 (2):94, 1931, (in part).

Diagnosis.—Rostrum with margins interrupted, small lateral spines or tubercles may or may not be present; margins not conspicuously thickened, either subparallel or slightly convergent; median carina absent. Chela punctate except for two irregular rows of ciliated squamous tubercles along inner margin of palm; opposable margin of immovable finger bearded at base. Areola approximately 8 or 9 times

³I take pleasure in naming this new species in honor of my friend and colleague, Dr. Rendell Rhoades, of the Ohio Division of Conservation and Natural Resources.

longer than broad with two or three punctations in narrowest part—length 32-34 percent of entire length of carapace. In male, hooks on ischiopodite of third pereopod only. Terminal elements of first pleopod of first form male extending to base of second pereopod, and separated for some distance proximad of tips; terminals, subequal in length and subparallel, *extend almost straight to base of distal third where they bend abruptly caudad* so that the distal cephalic surfaces of both are almost at right angles to the main shaft of the appendage. Annulus ventralis immovable (see fig. 9 for surface contour).

Holotypic Male, Form I.—Body subovate, somewhat depressed. Abdomen narrower than thorax (14.9-16.6 mm.). Width of carapace greater than depth in region of caudodorsal margin of cervical groove (16.6-13.4 mm.).

Areola of moderate width (8.3 times longer than broad), with two or three punctations in narrowest part; cephalic section of carapace about 2.1 times as long as areola (length of areola about 32 percent of entire length of carapace).

Rostrum with margins not thickened, slightly divergent at base, but for the most part subparallel. Upper surface concave and with prominent, somewhat crowded punctations. Base of acumen set off by minute corneous tubercles. Acumen short; tip broken in holotype but ending in a long spine in other specimens; this spine reaching distal end of peduncle of antennule. Subrostral ridge moderately developed and evident in dorsal aspect for more than half the length of the rostrum. Weak rostral ridge flanked mesially by a row of setiferous punctations.

Postorbital ridge prominent, grooved laterad, and terminates cephalad in a small corneous tubercle. Suborbital angle weak and rounded. Branchiostegal spine small but acute. Small lateral spine present on each side of carapace. Surface of carapace granulate laterally and bearing conspicuous punctations dorsally; the usual polished area in the gastric region bearing conspicuous punctations also.

Cephalic section of telson with a single spine in each caudolateral corner.

Epistome with lateral portions raised (ventrally) and a small cephalo-median projection (see fig. 8).

Antennule of the usual form with a small spine present on ventromesial surface of basal segment.

Antennae broken in holotype but extending caudad to last abdominal segment in other specimens. Antennal scale irregular in holotype but with a broad lamellar portion, broadest in middle; spine on outer cephalic margin moderately strong (see fig. 6).

Right chela somewhat depressed and elongated; palm somewhat inflated, marked above and below by prominent setiferous punctations. Inner margin of palm with two irregular rows of squamous tubercles—approximately seven in each row with a few additional ones at base. Fingers distinctly gaping. Upper surfaces of both fingers with a submedian ridge devoid of punctations and a somewhat narrower one lying toward the opposable margin. Opposable margin of immovable finger with a single row of 12 low rounded corneous tubercles and a conspicuous tuft of plumose setae on proximal two-thirds of lower opposable surface. Opposable margin of dactyl with a row of 14 tubercles similar to those on immovable finger. A single row of minute denticles occurs

on the distal third of the opposable margins of both fingers. Lateral margin of immovable finger strongly convex and not keeled along basal portion. Mesial margin of dactyl with a few small squamous tubercles on basal third. Lower surfaces of both fingers with a poorly defined submedian ridge.

Carpus of first right pereopod longer than broad with a deep longitudinal furrow above. Mesial surface with two tubercles—the distal one large and acute, the proximal one small and obtuse. Lower cephalic margin with a broad, low tubercle near middle, and a somewhat larger one on lateral angle. Upper surface strongly punctate, scattered punctations on other surfaces.

Upper surface of merus with two small acute tubercles near distal end; lower surface with a mesial row of nine very small tubercles and two laterad of this row, the more distal one of the latter two larger than all the others. Lower distal margin with a broad low tubercle on mesial and lateral angles. Scattered punctations on all surfaces.

Hooks on ischiopodites of third pereopods only; hooks only moderately strong; proximal margin concave and bearing setae.

Coxopodites of fourth and fifth pereopods not conspicuously ornamented.

First pleopod reaching coxopodite of second pereopod when abdomen is flexed. Tip terminating in two distinct parts which are separated for more than half their lengths. Both terminals comparatively slender, and subparallel; their proximal two-thirds relatively straight, and at base of distal third of each, rather suddenly recurved caudad. Mesial process grooved distally on cephalolateral side. Central projection very slender distally and tapering to a point; tip extends almost as far caudad as does mesial process. Both terminals partially corneous.

Morphotypic Male, Form II.—Differs chiefly from the holotype in that most of the tubercles mentioned in the above description are spiniform. Cephalic section of telson with two spines in each caudolateral corner. Hooks on ischiopodites of third pereopods reduced and knob-like. First pleopod with two terminals in apposition almost to tip; neither terminal slender nor corneous, and distal portions of both directed caudadistad at about a 60 degree angle to the main shaft of the appendage. See measurements for other differences.

Allotypic Female.—Except for body proportions (see measurements) and secondary sexual characters, the allotype agrees with the description of the holotype very well. Annulus ventralis subovate with the greatest length in the transverse axis; narrow deep anteromedian groove extends from midcephalic margin caudosinistrad to midlength where it joins a prominent central depression; in the cephalodextral portion of the latter is the fossa or "orifice"; suture originates at the dextral margin of the central depression, and extends sinistrocaudad almost to the median line where it turns caudad and terminates before reaching the midcaudal margin of the annulus. (See fig. 9).

Type Locality.—Otter Creek between Granny White Pike and Hillsboro Pike, about seven miles south of Nashville, Davidson County, Tennessee. Dr. C. S. Shoup has kindly supplied me with the following information concerning the type locality. This stream drains Radnor Lake, about six miles southwest of Nashville, and is typical of lake drainages in this section of the Central Basin. Ordovician limestone

underlies the soils of this area, and the stream flows through alternating thin woods, pastures, and along a macadam road. "The rather high free carbon dioxide found along most of this stream is indicative of lower (bottom) lake seepage and drainage. . . . Food grade for bottom organisms good. Minnows abundant." The following data were obtained from two localities in the region from which the crayfish were taken. Station I—200 yards below Radnor Lake; and Station II—about two miles below Station I. Data taken on September 8, 1948, 1:00 P.M., overcast.

	Station I	Station II
Air Temperature	82°F	82°F
Water Temperature	67°F	70°F
pH ₁	7.4	7.4
pH ₂ , following aeration to remove CO ₂	8.1	8.1
Free CO ₂	9.5 p.p.m.	4.5 p.p.m.
Total Alkalinity (bicarbonate)	150.0 p.p.m.	150.0 p.p.m.
Rate of flow	not more than ½ ft./sec.	
General cover grade about	L ₂ S ₂ R ₄	

Measurements in Millimeters

	Holotype	Morphotype	Allotype
Carapace			
Height	13.4	11.7	11.0
Width	16.6	13.5	13.5
Length	31.3	27.7	27.0
Areola			
Width	1.2	1.0	1.0
Length	10.0	8.5	8.6
Rostrum			
Width	5.2	4.2	4.5
Length	8.3	7.9	7.5
Abdomen—Length	34.5	31.4	31.0
Right Chela			
Length of inner margin of palm	8.9	4.9	4.7
Width of palm	13.0	6.6	6.4
Length of outer margin of hand	33.8	18.4	16.3
Length of dactyl	23.0	12.3	10.5

Disposition of Types.—The male holotype and male morphotype (No. 87953) and the allotypic female (No. 87954) are deposited in the United States National Museum. Of the paratypes, one first form male and a female are deposited in the University of Michigan Museum of Zoology, and two first form males, one second form male, and two females are in my personal collection at the University of Virginia.

Specimens Examined.—TENNESSEE: *Davidson County*—Harpeth River to Cumberland—(1) the type locality (1♂ I, 1♂ II, 1♀) May 24, 1945, Mike Wright, coll.; (2) tributary to Harpeth River near Bellevue (2♂♂ I, 1♀) November 11, 1944, C.S. Shoup, coll.; (3) tributary to Harpeth River on Old Hickory Boulevard near Hillsboro Pike (1♂ I, 1♂ II, 2♀♀) November 11, 1944, C.S. Shoup, coll.; (4) Otter Creek (1♀) June 1, 1945, Mike Wright, coll.; (5) Otter Creek below Radnor Lake (1♀) June 9, 1945, Mike Wright, coll.; (6) Otter Creek at Hillsboro Pike (2♀♀) May 19, 1945, Mike Wright, coll. Mill Creek to Cum-

berland—(7) Mill Creek near Antioch (1♀) November 11, 1944, C. S. Shoup, coll.; (8) Mill Creek at Antioch Pike (1♂ immature) July 19, 1945, Mike Wright, coll. *Williamson County*—Little Harpeth River to Cumberland—(9) Pond along S. R. 100 near Little Harpeth River just south of Davidson County line (2♂ o. imm., 2♀ ♀ imm.) May 24, 1945, Mike Wright, coll.

Variations.—Among the specimens listed above I can detect no variations of significance other than the usual differences associated with age.

Relationships.—*Orconectes rhoadesi* seems to have its closest affinities with *Orconectes validus* (Faxon 1914: 382). In fact the two species were confused by Faxon (ibid.: 383); however, they may be easily separated on the structure of the first pleopod of the male—in *validus* the cephalic surface is gently recurved through the distal half, while in *rhoadesi* it is almost straight to base of distal third where it is suddenly recurved caudad; further in *validus* the central projection does not extend nearly so far caudad as does the mesial process, but in *rhoadesi* it extends as far, or almost as far, caudad as does the mesial process. *O. validus* has been reported from the Tennessee River drainage from Huntsville, Madison County, Alabama.

I wish to express my appreciation to the following who have contributed most of the specimens on which this report is based: Dr. C. S. Shoup, Dr. Mike Wright, Mr. L. J. Marchand, Mr. Fred Campbell, and Mr. L. Stewart.

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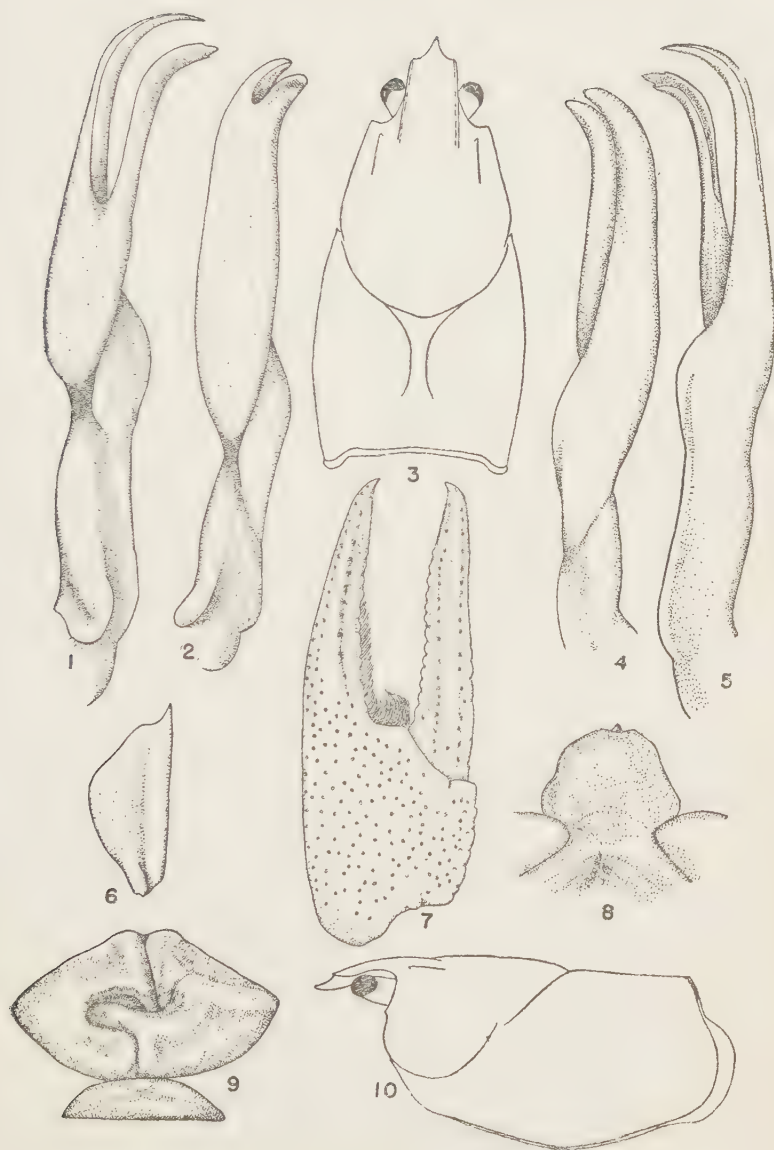
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Orconectes rhoadesi, sp. nov.

Explanation of Plate

Pubescence removed from all structures except figure 7.

- Fig. 1. Mesial view of first pleopod of first form male.
- Fig. 2. Mesial view of first pleopod of second form male.
- Fig. 3. Dorsal view of carapace.
- Fig. 4. Lateral view of first pleopod of second form male.
- Fig. 5. Lateral view of first pleopod of first form male.
- Fig. 6. Antennal scale.
- Fig. 7. Upper surface of chela of male, form I.
- Fig. 8. Epistome.
- Fig. 9. Annulus ventralis.
- Fig. 10. Lateral view of carapace.



PROCEEDINGS
OF THE
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A NEW HOUSE FINCH FROM THE PALOUSE
COUNTRY OF THE NORTHWESTERN UNITED
STATES

BY JOHN W. ALDRICH

During the course of studying the geographic variation of the birds of Washington State, I have noted a marked racial difference in the house finches resident in the eastern part of that state from adjoining populations on the coast and in the Great Basin. This differentiation seems to be general and constant in the population of house finches occupying the Palouse prairie region of the Columbia plateau, north of the Blue Mountains of Oregon, and between the Cascade Mountains on the west and the Rocky Mountains on the east. So different are these birds in all sex and age plumages and so circumscribed is their range, that it appears to me they should be considered as a distinct subspecies that may be characterized as follows:

Carpodacus mexicanus sordidus, new subspecies
Palouse House Finch.

Type.—No. 395960, U. S. National Museum (Fish and Wildlife Service Collection); adult male, Pullman, Washington, July 12, 1948; T. D. Burleigh, original number 11199.

Subspecific characters.—Similar to *Carpodacus mexicanus grinnelli* of western Oregon and California, but slightly darker and much more grayish, less brownish, above and below; also less of the reddish wash on back and neck, and red of head, rump, throat, and breast more restricted and deeper less orange in tone, being near spectrum red or carmine rather than scarlet red. It differs from *C. m. solitudinis* of the Great Basin region in Nevada to an even greater degree by reason of being much darker as well as more grayish and the reds purer and deeper, less scarlet. The combination of characters gives a relatively dusky appearance when compared with other races.

The females differ in the same way as the males from *grinnelli* and *solitudinis* with respect to the brown markings which are more grayish, less brownish, and particularly as regards the ventral streaks which are heavier and darker than in either of the other two races. There is no significant size difference from either of the above-mentioned neighboring forms.

Measurements.—Adult male (14 adult, spring and summer specimens); wing, 77-80 (78.2); tail, 57.5-62 (60.0); exposed culmen 9.5-11 (10.3);

tarsus, 15-18 (16.8); middle toe, without claw, 14-15.5 (14.6). Adult female (6 adult, spring and summer specimens): wing, 72.5-75.5 (74.4); tail 55.5-60 (57.3); exposed culmen 9-10.5 (9.8); tarsus 15-18 (16.8); middle toe without claw, 12.5-15.5 (14.1).

Distribution.—Permanent resident in eastern Washington (east of the Cascade Mountains) and northwestern Idaho; probably also adjoining portions of intermontane British Columbia where the species occurs. Specimens of *Carpodacus mexicanus sordidus* have been identified as follows:

Washington—Eureka, Walla Walla Co., Nov. 3, 1941, ♂; Pullman, Apr. 30, 1942, ♂, Dec. 12, 1947, ♂, July 12, 1948, ♂ (Type); College Place, Feb. 18, 1937, ♂, Apr. 8, 1937, ♂, Oct. 17, 1937; Kiona, Oct. 18, 1916, ♀, Dec. 9, 1919, ♂, Dec. 11, 1919, ♀, Dec. 11, 1919, ♂, (Juv.); Wallula, Mar. 27, 1937, ♂, Apr. 2, 1939, ♂; Wenatchee, Apr. 29, 1934, ♀, July 9, 1933, ♂, Aug. 29, 1934, ♂, Apr. 12, 1934, ♀; White Bluffs, Nov. 1, 1941, ♀; Yakima, July 6, 1936, ♂; Clarkston May 11, 1948, ♂; Gibbon, May 18, 1934, ♀; Wenas Valley, Yakima County, Cleman Ranch, Sept. 22, 1917, ♂ (Juv.); Zillah, Mar. 8, 1919, ♂; Wawawai, June 12, 1937, ♂ (Imm.), June 12, 1937, —(Imm.), June 12, 1937, ♀ ? (Imm.), Mar. 9, 1941, ♀; Roosevelt, Oct. 29, 1941, ♀, Dec. 18, 1942, ♀, Dec. 18, 1942, ♂; Harrah, Oct. 25, 1945, ♀ (Juv.), Oct. 25, 1945, ♂ (Juv.), Oct. 25, 1945, ♂.

Idaho—Troy, June 25, 1948, ♀; Lewiston, Dec. 18, 1947, ♂; Moscow, Jan. 30, 1948, ♀, May 8, 1948, ♀, Dec. 2, 1947, 2 ♀, Dec. 16, 1947, ♂, July 7, 1948, ♂, Jan. 11, 1948, ♂, Jan. 21, 1948, ♂, June 15, 1948, ♂, June 17, 1948, 2 ♂, Aug. 6, 1948, ♀, July 14, 1948, ♂, July 22, 1948, ♂, ♀ (Imm.), July 27, 1948, ♂, July 15, 1948, ♀ (Imm.), ♂ (Imm.).

For the loan of pertinent comparative material, acknowledgment is made to Charles R. Conner Museum, State College of Washington; Walla Walla College; State Museum, University of Washington; Mr. John B. Hurley, Yakima, Washington; Museum of Vertebrate Zoology, University of California. For a good series of breeding specimens of this new subspecies from the vicinity of Moscow, Idaho, and Pullman, Washington, I am indebted to the diligent collecting of Thomas D. Burleigh of the Fish and Wildlife Service, who is now stationed in that area for the purpose of making an intensive study of the birds of Idaho.

PROCEEDINGS
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TWO NEW COYOTES FROM THE UNITED STATES

BY HARTLEY H. T. JACKSON

Recent taxonomic research on the American species *Canis latrans* has shown the necessity of naming two new subspecies in order to clarify relationships within the group. These two new forms may be recognized by the following descriptions.

***Canis latrans thamnos*, subsp. nov.**

Northeastern Coyote or Brush Wolf

Type specimen.—No. 233,034, U. S. National Museum, Biological Surveys collection; ♂ young adult, skin and skull; collected September 4, 1919, by Harry H. Sheldon. Original number 1073.

Type locality.—Basswood Island, Apostle Islands, Ashland County, Wisconsin.

Diagnostic characters.—A large, heavy-set, rather dark coyote, with broad skull, relatively short rostrum, and heavy dentition. About the size of *Canis latrans latrans*, or larger, but darker in color with more blackish intermixed on the face, back, and tail, and muzzle and back of ears deeper shade, more fulvous; skull relatively broader; rostrum relatively more dished. Darker and larger than *Canis l. incolatus*, skull relatively broader, dentition heavier.

Measurements.—Type-specimens: No external measurements from animal in flesh available. Hind foot (measured from dry skin), 180. Skull of type specimen: Condylbasal length, 192.8; palatal length, 99.6; squamosal constriction, 62.0; zygomatic breadth, 108.4; interorbital breadth, 35.6; maxillary tooth row, 87.3; upper carnassial length, 21.2; first upper molar length, 13.5; first upper molar breadth, 18.6; lower carnassial length, 23.6.

Geographic range.—East-central Saskatchewan, extreme eastern North Dakota, Minnesota, Iowa, northern Missouri, easterly through Wisconsin, northern and central Illinois, northern Indiana, to eastern and southern Ontario.

***Canis latrans umpquensis*, subsp. nov.**

Northwestern Coast Coyote

Type specimen.—No. 216,537, U. S. National Museum, Biological Surveys collection; ♀ young adult, skin and skull; collected March 11, 1916, by W. T. Tison. Original number 16; Biological Surveys miscellaneous number 15,880X.

Type locality.—Five miles southeast of Drew, Douglas County, Oregon.

Diagnostic characters.—A small, rufous-tinged, dark-colored coyote, with distinct black markings on the forelegs and deep fulvous or rufous on both hind and forelegs, usually with cast of rufous on rump; ears

relatively large; skull comparatively small, dentition weak. Smaller than *Canis l. lestes*, darker and deeper rufous color on legs; skull smaller, dentition weaker. Smaller and darker than *C. l. ochropus*, deeper rufous on the legs; ears smaller; skull averaging smaller than in *ochropus*.

Measurements.—No external measurements of type specimen are available. Adult male from Forks, Clallam County, Washington (No. 274,904, U. S. N. M., B. S. coll.): Total length, 1,247; tail vertebrae, 358; hind foot, 207; ear from notch, 122; weight $27\frac{1}{4}$ pounds. *Skull* of type specimen: Condylbasal length, 17.1; palatal length, 86.4; squamosal constriction, 57.5; zygomatic breadth, 94.0; interorbital breadth, 29.5; maxillary tooth row, 78.5; upper carnassial length, 17.3; first upper molar length, 11.9; first upper molar breadth, 16.1; lower carnassial length, 20.0.

Geographic range.—West of the Cascade Mountains, in Oregon and Washington.

U. S. Fish and Wildlife Service, Washington, D. C.

PROCEEDINGS
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EIGHT NEW BIRDS FROM THE SUBTROPICAL ZONE
OF THE PARIA PENINSULA, VENEZUELA

BY WILLIAM H. PHELPS AND WILLIAM H. PHELPS, JR.

Inasmuch as there are no records of collections from the Subtropical Zone of the Paria Peninsula, the extreme north-eastern tip of the South American continent, we sent there our head collector, Ramón Urbano, on three separate expeditions, at different months of the year as a check against possible seasonal plumage variations, to collect on the two highest mountains, Cerro Azul and Cerro Humo. The former is situated directly back of Cristóbal Colón, near the tip, and the latter northwest of Irapa, in the center of the peninsula. 790 birdskins were obtained: Cerro Azul, 434 specimens, August 30-September 27, 1947 and May 24-June 4, 1948; Cerro Humo, 356 specimens, November 24-December 10, 1947 and May 2-19, 1948.

Although native hunters collected humming birds there, in the Subtropical Zone, for the millinery trade about 1873, only four collections,^{1,2} previous to ours, have been recorded from the Paria Peninsula: Dalmas in 1895, Bond in 1911, Miller in 1913 and Fry in 1937 but none of these four ascended the mountains to the Subtropical Zone, although Miller collected at 500 meters on the "mountains above Cristóbal Colón," which was probably the southern slope of Cerro Azul, and Chapman described *Columba subvinacea peninsularis* and *Oreopeleia linearis pariae* from that locality.

The senior author wishes to thank Dr. Herbert Friedmann of the United States National Museum, Mr. W. E. Clyde Todd of the Carnegie Museum, Mr. Emmet R. Blake of the Chicago Natural History Museum, Mr. Rodolphe Meyer de Schauensee of the Academy of Natural Sciences of Philadelphia and Dr. John T. Zimmer of the American Museum for their aid in the examination of specimens in their institutions.

The range of each of the apparently new birds described in this paper probably comprises, and is limited to, the Subtropical Zone of the Paria Peninsula.

The specimens listed as examined are in the Phelps Collection, Caracas, unless otherwise specified.

Names of colors are capitalized when direct comparison has been made with Ridgway's "Color Standards and Color Nomenclature."

¹W. H. Phelps and W. H. Phelps, Jr.: The Discovery of the Habitat of Gould's Hummingbird, *Hylonympha macrocerca*. The Auk, 65, January, p. 65, 1948.

²W. H. Phelps: Resumen de las Colecciones Ornitológicas hechas en Venezuela. Bol. Soc. Ven. Cin. Nat., No. 61, pp. 331, 343, 395 and 397, 1944.

***Synallaxis cinnamomea pariae*, new subspecies**

Type: From Cerro Humo, Irapa, Peninsula de Paria, Sucre, Venezuela. No. 44216, Phelps Collection, Caracas, Venezuela. Adult male collected May 4, 1948, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Closest to *S. c. striatipectus*, from the Cerro Turumiquire region, from which it differs by a less prominent superciliary stripe, duller and less prominent dark streaks on breast and abdomen (olivaceous instead of blackish), less striping on abdomen, the black stripes on throat being more prominent than the white ones.

Range: Known only from the Subtropical Zone (900-1200 meters) of Cerro Humo and Cerro Azul on the Paria Peninsula.

Description of Type: Crown Vandyke Brown merging into grayish on forehead close to bill; back and uropygium Vandyke Brown; superciliary stripe Ochraceous-Tawny; lores dusky; ear-coverts Vandyke Brown; gular region striped Ochraceous-Tawny and black, more narrowly than on breast. Chin and anterior throat striped black and white merging into the Ochraceous-Tawny and black of the posterior throat which in turn merges into the dusky olivaceous and paler stripes of breast; abdomen paler, grayish olive, with buffy white stripes except posteriorly; sides, flanks, shanks and under tail-coverts near to Dresden Brown. Remiges Benzo Brown, outer vanes, except on the two outermost primaries, edged, except apically, with Mahogany Red; inner vanes of tertials tinted with reddish; inner vanes of primaries and secondaries edged with Vinaceous-Fawn, basally on outermost and increasing in extent inwardly; upper wing-coverts Mahogany Red; bend of wing, under wing-coverts and axillaries Tawny. Tail above Liver Brown, below pale brown.

Bill (in life) "black, base of mandible grayish"; feet "greenish gray"; iris "chestnut." Wing, 58 mm; tail, 58; exposed culmen, 15; culmen from base, 17.5; tarsus, 21.

Remarks: Sexes alike in coloration but females have shorter wings. Size similar to *striatipectus*. Range of measurements: five adult males—wing, 57-59 (58) mm; tail, 58-68 (63); culmen from base, 16-17.5 (16.5); five adult females—wing, 54-56 (54.6); tail, 61-67 (63.6); culmen from base, 16-18 (16.8). Measurements of *striatipectus*: four adult males—wing, 55-56 (55.5); tail, 61-68 (63.2); culmen from base, 16-16 (16); five adult females—wing, 53-55 (54.2); tail, 59-68 (65.2); culmen from base, 15-17 (16.2).

The juveniles have the throat black with white spots and the breast is more spotted, less streaked. May and June specimens have breeding gonads. Specimens were collected: 15 in May, 6 in June, 1 in August, 4 in September and 4 in November.

SPECIMENS EXAMINED

S. c. cinnamomea.—VENEZUELA: La Sabana, Perijá, 2 ♂, 1 ♀. COLOMBIA: "Bogotá," 6(?)³.

S. c. avelodoi.⁴—VENEZUELA: Lara, 10; Falcón, 7; Táchira, 3.

S. c. bolivari.—VENEZUELA: Yaracuy, 1⁴; Carabobo, 1⁴; Dto. Federal, 3⁴; Miranda, 17⁴; Cumbre de Valencia,³ 1 ♀ Silla de Caracas,⁵ 2 ♂, 2 ♀; Galipán³, 2 ♂, 2 ♀.

S. c. striatipectus.—VENEZUELA: Quebrada Bonita, 3 ♂, 3 ♀, 1(?)

Cerro El Peonía, 1 ♀; Cerro Negro, 1 ♂, 3 ♀, 2(♂); Quebrada Seca,³ 1 ♂, 1 ♀; La Tigrera,³ 1 ♀; Los Palmales,³ 1 ♂, 2 ♀; Caripe,³ 1(♂).

S. c. pariae.—VENEZUELA: Cerro Humo, 5 ♂ (incl. type), 8 ♀, 3(♂); Cerro Azul, 5 ♂, 5 ♀, 4(♂).

S. c. carri.—TRINIDAD³: 4♂, 2♀.

Premnoplex tatei pariae, new subspecies

Type: From Cerro Humo, Irapa, Península de Paria, Sucre, Venezuela. No. 41041, Phelps Collection, Caracas, Venezuela. Adult male collected November 29, 1947, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from *P. t. tatei* of the Cerro Turumiquire region by much more extensive light markings below; almost immaculate buffy throat instead of white with squammations; breast with less distinct squammations; abdomen with wider whitish streaks; crown darker, more dusky.

Range: Known only from the Subtropical Zone (900-1200 meters) of Cerro Humo and Cerro Azul on the Paria Peninsula.

Description of Type: Top of head brownish olive the feathers edged with dusky, giving a faintly scalloped appearance, the feathers of forehead with indistinct pale shaft stripes; a wide dusky nuchal collar, the feathers with prominent pale buffy shaft streaks; back Auburn, feathers with faint dusky shaft streaks; uropygium Auburn; lores dusky; post-ocular superciliary streak, gular region and sides of neck streaked with pale buffy and dusky, continuous with nuchal collar; ear-coverts dusky mixed with buffy white. Chin and throat buffy white, feathers very faintly edged with dusky, merging into the pale Cream-Buff breast, the feathers with more accentuated dusky edges giving a faint scalloped appearance; abdomen has a streaked appearance, the feathers uniform with those of breast but with heavy dusky brownish edgings; sides and flanks dusky brown, the feathers with prominent whitish buff shaft streaks; shanks and under tail-coverts Prout's Brown. Remiges Fuscous; primaries narrowly edged with grayish brown, secondaries and tertials broadly with Auburn; upper wing-coverts Auburn, uniform with back, the feathers with dusky shaft streaks; bend of wing, under wing-coverts and axillaries buffy white mixed with dusky. Central rectrices dusky brown, remaining ones Fuscous with dusky brown outer vanes; lower aspect of tail pale brownish.

Maxilla (in life) "black"; mandible "flesh, black tip"; feet "black"; iris "dark." Wing, 60 mm; tail, 56; exposed culmen, 16; culmen from base, 20; tarsus, 20.

Remarks: Sexes alike. Size similar to *tatei*. Range of measurements: five adult males—wing, 60-62 (61.4) mm; tail, 56-59 (57.4); culmen from base, 20-21 (20.2); five adult females—wing, 58-61 (59.8); tail, 51-58 (54.6); culmen from base, 19-21 (20). Measurements of *tatei*: five adult males—wing, 59-61 (60); tail, 57-64 (60.8); culmen from base, 19-20 (19.4); five adult females—wing, 59-61 (59.8); tail, 57-60 (59); culmen from base, 19-20 (19.2).

May specimens of *pariae* have breeding gonads as have August speci-

³Specimens in the American Museum of Natural History.

⁴For localities see Phelps and Phelps, Jr., Bol. Soc. Ven. Cien Nat., No. 65-66, p. 152, 1945-1946.

mens of *tatei*. Specimens were collected: 16 in May, 8 in September and 8 in November.

The immature plumage is similar to the adult.

SPECIMENS EXAMINED

P. t. tatei.—VENEZUELA: Cerro Turumiquire, 1 ♂;⁸ Cerro El Peonía, Bergantín, 1 ♂; Cerro Negro, Caripe, 11 ♂, 7 ♀, 9(?).

P. t. pariae.—VENEZUELA: Cerro Humo, 11 ♂ (incl. type); Cerro Azul, 6 ♂, 3 ♀, 2(?).

Grallaricula nana pariae, new subspecies

Type: From Cerro Azul, Cristóbal Colón, Península de Paria, Sucre, Venezuela. No. 44025, Phelps Collection, Caracas, Venezuela. Adult male collected May 28, 1948, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Closest to *G. n. cumanensis* of the Mt. Turumiquire region but darker above, back more purely olivaceous lacking the yellowish brown tinge. Besides other strong characters, *olivascens*, *nana* and *kukenamensis* have much smaller bills than *pariae*.

Range: Known only from the Subtropical Zone (820-1200 meters) of Cerro Azul and Cerro Humo on the Paria Peninsula.

Description of Type: Forehead, except in the center, Orange-Buff × Cadmium Yellow; center line of forehead, crown and nape Deep Mouse Gray; back, rump and upper tail-coverts Medal Bronze, the long back feathers covering the basal half of tail subterminally white and tipped with pale buff forming a band; orbital ring anteriorly buffy, posteriorly whitish; a dusky preocular lunule. Below Ochraceous-Orange, darkest on breast, sides and flanks and paler on chin and throat; a prominent white spot on anterior breast; entire abdomen white; shanks and under tail-coverts buffy. Remiges Fuscous, outermost edged with pale buff, the others with brownish, most extensively on tertials; remiges edged with buff internally, the outer ones only basally; greater and median upper wing-coverts tipped with dark buffy forming two indistinct bands; primary coverts entirely blackish partly covering a buffy speculum; bend of wing buffy; axillaries and under wing-coverts Cadmium-Orange. Tail darker, browner, than the back.

Bill (in life) "maxilla black, mandible flesh"; feet "purplish flesh"; iris "dark." Wing, 66 mm; tail, 28; exposed culmen, 15; culmen from base, 18; tarsus, 25.

Remarks: Sexes alike. Size similar to *cumanensis*. Range of measurements: five adult males—wing, 64-70 (66) mm; tail, 28-30 (28.8); culmen from base, 18-18 (18); five adult females—wing, 64-66 (65); tail, 26-28 (27.2); culmen from base, 18-19 (18.4). Measurements of *cumanensis*: five adult males—wing, 64-69 (66.6); tail, 27-27 (27); culmen from base, 17-18 (17.5); three adult females—wing, 62-66 (64.3); tail, 26-27 (26.3); culmen from base, 17-18 (17.7).

May specimens have breeding gonads. Specimens were collected: 36 in May, 1 in June, 1 in August, 8 in September and 6 in November.

The immature plumage is similar to the adult except that the center of forehead, crown and nape is dark brown and the white area of the abdomen is lacking.

SPECIMENS EXAMINED

G. n. nana.—VENEZUELA: Boca de Monte, Táchira, 2 ♂, 1 ♀; Quintero, 1 ♂; Páramo El Escorial, 3 ♂; ³ Páramo de la Culata, 3 ♂; Páramo Cendé, Trujillo, 1 ♂, 1 ♀.

G. n. olivascens.—VENEZUELA: Colonia Tovar, 2 ♀, 1(?) ; El Junquito, 1 ♀; Cerro El Avila, ³ 1 ♂, 1 ♀.

G. n. cumanensis.—VENEZUELA: Cerro El Peonía, Bergantín, 1 ♂; Cerro Negro, Caripe, 1 ♂; Los Palmales, ³ 1 ♂ (type), 1 ♀; Rincón de San Antonio, 1 ♀; ³; Latal, 1 ♀. ³

G. n. pariae.—VENEZUELA: Cerro Azul, 11 ♂ (incl. type), 7 ♀, 10(?); Cerro Humo, 14 ♂, 8 ♀, 2(?).

G. n. kukenamensis.—VENEZUELA: Arabupú, 1 ♂; Cerro Ptari-tepui, 1 ♂, 3 ♀, 2(?); Cerro Sororopán-tepui, 4 ♂, 3 ♀, 1(?); Cerro Chimantá-tepui, 1 ♂, 2 ♀.

Grallaria haplonota pariae, new subspecies

Type: From Cerro Azul, Cristóbal Colón, Península de Paria, Sucre, Venezuela. No. 44048, Phelps Collection, Caracas, Venezuela. Adult male collected May 29, 1948, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from *haplonota*, of the Caracas region, by much more reddish under tail-coverts and darker under parts, more ochraceous, less buffy.

Range: Known only from the Subtropical Zone (900-1200 meters) of Cerro Azul and Cerro Humo on the Paria Peninsula.

Description of Type: Above Dresden Brown, paler on rump, feathers faintly edged with dusky on back and more strongly on head; upper tail-coverts reddish chestnut; lores grayish; ear-coverts dusky olivaceous. Chin and center of throat whitish; sides of throat dusky olivaceous; narrow gular stripe whitish buff; breast, sides, flanks and shanks ochraceous, heavily shaded with dusky; abdomen paler; under tail-coverts Xanthine Orange. Wings Benzo Brown, all exposed surfaces uniform with back; outer vane of outermost primary buffy; under wing-coverts Xanthine Orange; axillaries ochraceous. Tail brown, paler or under surface.

Bill (in life) "black"; base of mandible "grayish purple"; feet "purple"; iris "dark." Wing, 98 mm; tail, 40; exposed culmen, 22; culmen from base, 28; tarsus, 45.

Remarks: Sexes alike. Size similar to *haplonota*. Range of measurements: five adult males—wing, 98-101 (99.4) mm; tail, 40-43 (41.8); culmen from base, 28-30 (29.2); five adult females—wing, 98-103 (101.2); tail, 39-43 (41.4); culmen from base, 28-30 (28.8). Measurements of *haplonota*: five adult males—wing, 99-107 (102.2); tail, 39-42 (40.8); culmen from base, 28-30 (29.2).

The females have laying ovaries. Specimens were collected: 12 in May, 1 in June and 1 in September.

The species has not been encountered in the Mt. Turumiquire region, so the nearest known subspecies is *haplonota* from the Caracas region.

SPECIMENS EXAMINED

G. h. haplonota.—VENEZUELA: Mt. Bucarito, 3(?)³; Cumbre de Valencia, 4 ♂, 1 ♂³; 5 ♀, 1 ♀³, 1(?); Paso Hondo, 1 ♀³; Hda. Santa

Clara, 1 ♂, 1 ♀; Colonia Tovar, 4 ♂, 3 ♀; Curupao, 1 ♀; Cerro Golfo Triste, 2 ♂.

G. h. pariae.—VENEZUELA: Cerro Azul, 7 ♂ (incl. type), 3 ♀; Cerro Humo, 1 ♂, 3 ♀.

***Pipreola formosa pariae*, new subspecies**

Type: Frim Cerro Azul, Cristóbal Colón, Península de Paria, Sucre, Venezuela. No. 40532, Phelps Collection, Caracas, Venezuela. Adult male collected September 18, 1947, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Similar to *P. f. rubidior* of the Mt. Turumiquire region but the red throat patch is more prominent and more extensive.

Range: Known only from the Subtropical Zone (900-1200 meters) of Cerro Azul and Cerro Humo on the Paria Peninsula.

Description of Type: Forehead and lores black; rest of head, including throat, lustrous dusky blue; nape, back and uropygium Mineral Green. Chin and throat lustrous dusky blue; large prominent Carmine patch on anterior breast; rest of breast orange tinged with Carmine; abdomen Lemon Yellow; under tail-coverts and axillaries Pale Lemon Yellow, sides and flanks more greenish; shanks dusky. Remiges Fuscous-Black edged externally with green except the outermost, more extensively on tertials; inner vanes narrowly edged with yellowish white, more extensively inwardly; remiges, except four outermost, tipped with white, much more broadly on tertials; exposed parts of upper wing-coverts green uniform with black; alula dusky; blend of wing yellowish and dusky; under wing-coverts whitish. Middle rectrices green uniform with back, others dusky; outer vanes green uniform with back; under aspects of tail paler dusky with a faint greenish sheen.

Bill (in life) "reddish orange"; feet "grayish green"; iris "yellowish orange." Wing, 90 mm; tail, 65; exposed culmen, 11; culmen from base, 15; tarsus, 20.5.

Remarks: Sexes different in color. Size similar to *rubidior*. Range of measurements: five adult males—wing, 89-90 (89.4) mm; tail, 62-65 (63.4); culman from base, 14-15 (14.6); five adult females—wing, 81-87 (84.4); tail, 57-65 (60.6); culmen from base, 14-15 (14.6). Measurements of *rubidior* from the Mt. Turumiquire region: five adult males—wing, 86-89 (87.8); tail, 58-65 (61.6); culmen from base, 15-15 (15); four adult females—wing, 84-87 (85.5); tail, 59-63 (60.7); culmen from base, 14-15 (14.7).

Description of female (no. 40548). Top of head, back, and uropygium Mineral Green; ear-coverts and malar region more olivaceous; lores dusky. Center of chin grayish with faint dusky barring; rest of under parts Greenish-Yellow, darkest on breast and barred with Parrot Green, most densely on breast; shanks greenish. Wings Fuscous-Black, exposed surfaces green uniform with back; inner vanes of remiges narrowly edged with yellowish white, more extensively inwardly; remiges tipped with whitish, except five outermost, more extensively on tertials. Tail dusky, exposed upper surface green uniform with back. Bill, feet and iris as in the male.

May, June and September females have laying ovaries. Specimens were collected: 22 in May, 6 in June, 22 in September and 4 in November.

SPECIMENS EXAMINED

P. f. formosa.—VENEZUELA: "Venezuela", 1 ♂³; San Jean, Puerto Cabello, 1 ♀; Cumbre de Valencia³, 3 ♂, 1 ♀; Colonia Chirgua, 2 ♂, 2 ♀; Hda. Santa Clara, Carabobo, 1 ♂, 1 ♀; San José de los Caracas, 1 ♂; Cerro Golfo Triste, 6 ♂, 4 ♀; Cerro Negro, Miranda, 1 ♂.

P. f. ribidior.—VENEZUELA: Quebrada Bonita, Bergantín, 1 ♂, 1 ♀; "Cumana", 2 ♂³; Los Palmales, 3 ♂³; Santa Ana Valley, 1 ♂³; Carapas, 1 ♂³; Cerro Turumiquire, 8 ♂⁵; Cumanacoa, 1 ♀⁶; La Elvecia, 1 ♀⁶; Cerro Negro, Caripe, 8 ♂, 3 ♀.

P. f. pariae.—VENEZUELA: Cerro Azul, 25 ♂ (incl. type), 11 ♀; Cerro Humo, 14 ♂, 4 ♀.

Pyrrhomyias cinnamomea pariae, new subspecies

Type: From Cerro Azul, Cristóbal Colón, Península de Paria, Sucre, Venezuela. No. 44087, Phelps Collection, Caracas, Venezuela. Adult male collected May 30, 1948, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from other subspecies by being darker brown below and blacker on the crown.

Range: Known only from the Subtropical Zone (800-1150 meters) of Cerro Azul and Cerro Humo on the Paria Peninsula.

Description of Type: Crown dusky Warm Sepia with a partly concealed large Light Cadmium crown patch; forehead, lores and nape Brussels Brown; back Auburn × Sanford's Brown, more dusky toward rump band; band across rump Raw Sienna; tail-coverts blackish, edged with rufous; sides of neck Amber Brown; ear-coverts more buffy. Chin grayish buff; rest of under parts Amber Brown, paler on under tail-coverts. Wings Fuscous; remiges, except four outermost, externally edged with Sanford's Brown which together with the broad Sanford's Brown tips to the greater wing-coverts and broad edgings to the tertails forms a large wing patch; median and lesser coverts broadly tipped with Sanford's Brown forming two conspicuous wing bands; under wing-coverts and axillaries Sanford's Brown. Upper aspect of tail dusky, outer vane of external rectrices Pecan Brown; lower aspect Pecan Brown except dusky apically; all rectrices faintly tipped with buffy.

Bill (in life) "black;" feet "black;" iris "brown." Wing, 71 mm; tail, 57; exposed culmen from base, 15; tarsus, 12.5.

Remarks: Sexes alike. Size similar to *spadix*.⁷ Range of measurements: five adult males—wing, 70-72 (71.2) mm; tail, 55-60 (57); culmen from base, 14-15 (14.4); five adult females—wing, 67-69 (67.6); tail, 55-58 (56.2); culmen from base, 14-14 (14).

May females have laying ovaries. These specimens were collected: 16 in May, 2 in June, 2 in August, 6 in September and 1 in November.

³Specimens in the Chicago Natural History Museum.

⁶Specimens in the Carnegie Museum.

⁷See Wetmore. Smith. Misc. Coll. 98, No. 4, p. 5, 1939.

SPECIMENS EXAMINED

P. c. cinnamomea.—PERU⁸: 40³.

P. c. pyrrhoptera.—VENEZUELA: Páramo de Tamá, 3 ♂, 1 ♀; Las Delicias, Táchira, 1 ♂; PERU⁸: 28³.

P. c. assimilis.—COLOMBIA³: Valparaiso, Santa Marta region, 5 ♂, 2 (♀); Las Nubes, 5 ♂, 1 ♀, 5 (♀); El Líbano, 3 ♀.

P. c. vieillotoides.—VENEZUELA: Mt. Bucarito, Lara, 2 (♀)³; Cubiro, 1 ♀; Bucaral, 1 ♂; Cumbre de Valencia, 1 ♂, 1 ♀; El Limón, 1 ♂³; Colonia Tovar, 1 ♀, 1 (♀)³; El Junquito, 2 ♂, 4 ♀, 2 (♀); 2 ♂³, 1 ♀³, 1 (♀)³; Cerro El Avila, 1 ♂³, 1 ♀, 1 (♀); Silla de Caracas, 1 ♂³; Hda. Izcaragua, Guarenas, 1 ♂; Curupao, 1 ♂, 1 (♀); Cerro Golfo Triste, 1 ♂, 2 ♀; Cerro Negro, Miranda, 1 ♂, 2 ♀, 1 (♀).

P. c. spadix.—VENEZUELA: Quebrada Bonita, Bergantín, 3 ♂, 1 (♀); Caripe, 3 ♂; Cerro Negro, 4 ♂, 4 ♀, 2 (♀).

P. c. pariae.—VENEZUELA: Cerro Azul, 12 ♂ (incl. type), 9 ♀; Cerro Humo, 2 ♂, 3 ♀, 1 (♀).

***Myioborus bruniceps pariae*, new subspecies**

Type: From Cerro Azul, Cristóbal Colón, Península de Paria, Sucre, Venezuela. No. 44106, Phelps Collection, Caracas, Venezuela. Adult male collected June 10, 1948, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from *M. b. castaneocapillus* in having eye-ring, supraloral streak and forehead, against the bill, yellow; superciliary streak and rest of forehead black; back grayish with yellowish olive cast instead of brownish olive; outer tail-feathers more extensively white.

Range: Known only from the Subtropical Zone (800-1200 meters) of Cerro Azul and Cerro Humo on the Paria Peninsula.

Description of Type: Crown Burnt Sienna X Mahogany Red, bordered anteriorly and laterally by black, the feathers elongated; back and uropygium Deep Mouse Gray tinged with olive, a few feathers on mantle with dusky shaft streaks, forehead, close to the bill, preorbital region and eye-ring Lemon Chrome; lores and malar stripe black; ear-coverts and sides of head Deep Mouse Gray. Under parts Lemon Chrome, more whitish on under tail-coverts; sides and thighs mixed with grayish. Wings Fuscous-Black; inner vanes of remiges bordered with whitish, more extensively interiorly; bend of wing yellowish; under wing-coverts and axillaries whitish. Six median rectrices Fuscous-Black, very faintly barred with dusky; outer rectrices entirely white, the following pair with a little dusky on the inner vanes basally, and the third pair with dusky region occupying more than one half of inner vanes basally.

Bill (in life) "black"; feet "blackish yellow"; iris "brown". Wing 63 mm; tail, 62; exposed culmen, 9; culmen from base, 13; tarsus, 19.

Remarks: Sexes alike. Smaller than *M. b. castaneocapillus*. Range of measurements: five adult males—wing, 59-63 (60.2) mm; tail, 59-62 (60.4); culmen from base, 12.5-13 (12.8); four adult females—wing, 57-60 (58.5); tail, 59-61 (60); culmen from base, 12-13 (12.6). Five adult males of *M. b. castaneocapillus*—wing, 63-66 (64.4); tail, 59-62

⁸For list of localities see Zimmer, Am. Mus. Nov., No. 1043, p. 2, 1939.

(60.8); culmen from base, 13-13.5 (13.3); five adult females—wing, 60-61 (60.6); tail, 57-61 (59.4); culmen from base, 13-13.5 (13.2).

May females have laying ovaries. Specimens were collected: 14 in May, 1 in June, 2 in September, 7 in November, 2 in December.

SPECIMENS EXAMINED

M. b. brunniceps.—BOLIVIA³: Chilon, 1 ♂; Pulque, 2 ♂, 1 ♀; Parotaní, 1 ♂, 1 ♀, 1 (?); Tujma, 3 ♂; Río Cachimayo, 3 ♂, 1 ♀. ARGENTINA³: San Pablo, 5 ♂, 5 ♀; Tucumán, 9 ♂, 6 ♀; Tafi Trail, 1 ♂, 1 ♀; Quebrada Escoipe, 1 ♂, 1 ♀.

M. b. castaneocapillus.—VENEZUELA: "Roraima"³, 3 ♂; Philipp Camp³, 9 ♂, 5 ♀, 1 (?); Rondon Camp³, 2 ♂, 4 ♀; Arabupú, 1 (?); Cerro Roraima, 1 ♂, 2 ♀, 2 (?); Cerro Ptari-tepui, 3 ♂, 3 ♀, 6 (?); Cerro Sororopán-tepui, 1 ♀, 3 (?); Cerro Chimantá-tepui, 5 ♂, 7 ♀, 7 (?); Cerro Uaipán-tepui, 4 ♂, 5 ♀, 2 (?); Cerro Aprada-tepui, 8 ♂, 3 ♀, 3 (?); Cerro Acopán-tepui, 3 ♀, 4 (?); Cerro Uei-tepui, 7 ♂, 5 ♀, 4 (?); Cerro Auyan-tepui³, 4 ♂, 4 ♀, 1 (?).

M. b. duidae.—VENEZUELA: Cerro Duida, 1 ♂, 1 ♀, 1 ♂³, 1 ♀³.

M. b. pariae.—VENEZUELA: Cerro Azul, 5 ♂ (incl. type), 1 ♀, 1 (?); Cerro Humo, 7 ♂, 6 ♀, 6 (?).

Basileuterus tristriatus pariae, new subspecies

Type: From Cerro Humo, Península de Paria, Sucre, Venezuela. No. 44320, Phelps Collection, Caracas, Venezuela. Adult male collected May 9, 1948, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from *B. t. meridanus* of the Mérida region, and from *B. t. bessereri* of the Caracas region, by darker upper parts, brownish olive instead of yellowish olive.

Range: Known only from the Subtropical Zone (800-1200 meters) of Cerro Humo and Cerro Azul on the Paria Penninsula.

Description of Type: Crown and nape with wide lateral dusky stripes; center line pale olivaceous with partly concealed Pale Orange-Yellow crown patch; forehead dusky olive; back and uropygium Citrine-Drab; post-ocular stripe pale olivaceous; ear-coverts grayish, malar region dusky. Throat and breast Naples Yellow, abdomen and under tail-coverts paler; sides, flanks and shanks olivaceous; wings Benzo-Brown × Fuscous; remiges and upper wing-coverts, except primary coverts, edged with Citrine-Drab, uniform with back; under wing-coverts and axillaries whitish. Tail Benzo-Brown × Fuscous, paler below, rectrices edged externally with Citrine-Drab uniform with back.

Bill (in life) "black, base sepia"; feet "yellow"; iris "red". Wing, 61 mm; tail, 53; exposed culmen, 9; culmen from base, 14; tarsus, 20.

Remarks: Sexes alike. Size of males larger than *bessereri*. Range of measurements: five adult males—wing, 60-63 (61) mm; tail, 52-57 (54); culmen from base, 13-14 (13.4); five adult females—wing, 56-59 (57.2); tail, 49-52 (50.6); culmen from base, 12.5-13 (12.9). Measurements of *bessereri*: five adult males—wing, 57-61 (59); tail, 52-54 (53.4); culmen from base, 12.5-13.5 (13.1); five adult females—wing, 53-58 (55.2); tail, 48-53 (51.4); culmen from base, 12-12.5 (12.2).

May females have laying ovaries. Specimens were collected: 29 in May, 1 in June, 1 in August, 3 in September, 7 in November and 2 in December.

Hellmayr⁹ says, referring to *B. t. meridanus*: "Specimens collected by A. Mocquers in the Tring Museum are labelled 'Caripé' but this is clearly a mistake." He formed this opinion because the species had never since been collected in the Mt. Turumiquire region. However, now that we know that the species is common in the subtropics of the Paria Peninsula, we can accept the information on the labels of the Caripe specimens. They do not belong to the new subspecies as their backs are similar to *meridanus* and we shall follow Hellmayr in considering them of that subspecies. Perhaps a good series may show that they represent a distinct race.

SPECIMENS EXAMINED

*B. t. melanotis*³.—COSTA RICA: Aquinares, 2 ♂; Quebradilla de Azajar, 2 ♀; Azajar de Cartago, 1 (?). PANAMA: "Chiriquí", 1 (?); Mt. Chiriquí, 1 ♂; Boqueti, 1 ♂, 1 ♀.

*B. t. tacarunae*³.—PANAMA: Mt. Tacarcuna, E. Panama, 6 ♂; 2 ♀.

*B. t. tacarunae*³.—PANAMA: Mt. Tacarcuna, E. Panama, 6 ♂; Tocarcuna, 3 ♀.

*B. t. daedalus*³.—ECUADOR: Guala, 3 ♂; Paramba, 1 ♂, 1 ♀, COLOMBIA: Cical, Cauca, 1 ♂; Cerro Munchique, 1 ♀.

*B. t. auricularis*³.—COLOMBIA: El Roble, Quindío Andes, 2 ♂, 1 ♀; Salento, 1 ♂, 1 (?); Palmira, Cauca, 3 ♂, 1 ♀, 1 (?); Gallera, 1 ♂, 1 (?); Las Lomitas, 2 ♀; San Antonio, 7 ♂, 1 ♀, 1 (?); La Palma, Huila, 1 ♂; La Candela, 7 ♂, 1 ♀; San Agustín, 1 ♂; Aquadita, 1 ♂; "Bogotá", 6 (?).

*B. t. baeza*³.—ECUADOR: Baeza, 2 ♂, 2 ♀; San José de Sumaco, 1 ♂; Sumaco, Abajo, 3 ♂, 4 ♀; Macas, 1 (?).

*B. t. tristriatus*³.—ECUADOR: Sabanilla, 1 ♀; PERU: Chelpas, 1 ♂, 1 ♀.

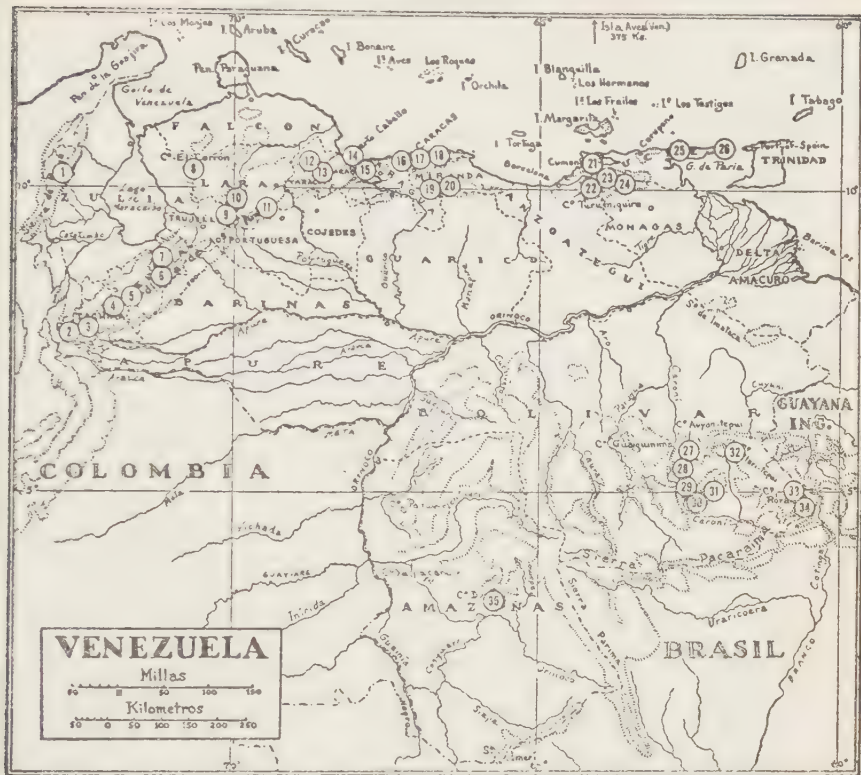
*B. t. punctipectus*³.—BOLIVIA: Inchacha, 1 ♂, 2 ♀; Locotal, 2 ♂, 1 ♀; Roquefalta, 2 ♂, 1 ♀, 1 (?); Nequejahuira, 1 ♂, 1 (?); Mapire, 1 (?); Yungas, 1 ♂.

B. t. meridanus.—VENEZUELA: Queniquea, Táchira, 1 ♂, 2 ♀; Seboruco, 1 ♀; Páramo de la Culata, Mérida, 1 ♀; Valle³, 1 ♂; Páramo de Cendé, Trujillo, 1 ♀; Cerro Niquitáz, 1 ♂; Cerro El Cerón, Lara, 1 ♂, 3 ♀, 1 (?); Cubiro, 2 ♂, 2 ♀, 3 (?); Bucarito³, 1 (?); Bucaral, Yaracuy, 1 ♀; Cumbre de Valencia, 1 ♂³; Caripe, Monagas, 2 (?).³

B. t. bessereri.—VENEZUELA: Colonia Tovar, 3 ♂, 2 ♀, 1 (?); No León, 2 ♂, 2 (?); El Junquito, 2 ♀, 1 ♂³; El Limón, 1 ♀³; Cerro El Avila, 1 ♂; Silla de Caracas, 1 ♂³; Galipán³, 2 ♂, 1 ♀; Cotiza³, 3 ♂, 2 ♀, 1 (?); Hda. Izcaragua, Guarenas, 1 ♀; Cerro Golfo Triste, 2 ♂, 1 ♀, 1 (?).

B. t. pariae.—VENEZUELA: Cerro Humo, 7 ♂ (incl. type), 11 ♀, 6 (?); Cerro Azul, 5 ♂, 7 ♀, 7 (?).

⁹Cat. Birds Americas, etc. Part 8, p. 496, 1935.



EXPLANATION OF PLATE IV

- | | |
|------------------------|------------------------|
| 31 Acopán-tepui, Cerro | 21 Cumaná |
| 29 Aprada-tepui, Cerro | 23 Cumanacoa |
| 33 Arabupú | 15 Cumbre de Valencia |
| 27 Auyán-tepui Cerro | 18 Curupao |
| 26 Azul, Cerro | 35 Duida, Cerro |
| 22 Bergantín | 17 El Avila, Cerro |
| 5 Boca de Monte | 8 El Cerrón, Cerro |
| 12 Bucaral | 16 El Junquito |
| 10 Bucarito, Cerro | 16 El Limón |
| 17 Caracas | 17 Galipán |
| 23 Carapas | 18 Guarenas |
| 24 Caripe | 19 Golfo Triste, Cerro |
| 30 Chimantá-tepui | 25 Humo, Cerro |
| 13 Colonia Chirgua | 25 Irapa |
| 16 Colonia Tovar | 18 Izcaragua, Hacienda |
| 17 Cotiza | 22 La Elvecia |
| 26 Cristóbal Colón | 1 La Sabana |
| 11 Cubiro | 23 La Tigerera |

- | | |
|---------------------------|----------------------------|
| 2 Las Delicias | 22 Quebrada Bonita |
| 23 Latal | 23 Quebrada Seca |
| 6 Mérida | 4 Queniquea |
| 24 Negro, Cerro (Caripe) | 7 Quintero |
| 20 Negro, Cerro (Miranda) | 23 Rincón de San Antonio |
| 9 Niquitáz, Cerro | 33 Rondón Camp |
| 16 No León | 33 Roraima, Cerro |
| 9 Páramo Cendé | 3 San Cristóbal |
| 7 Páramo de la Culata | 14 San Jean |
| 6 Páramo El Escorial | 18 San José de los Caracas |
| 2 Páramo de Tamá | 23 Santa Ana Valley |
| 25 Paria Peninsula | 15 Santa Clara, Hacienda |
| 14 Paso Hondo | 4 Seboruco |
| 22 Peonía, Cerro | 17 Silla de Caracas |
| 25 Península de Paria | 32 Sororopán-tepui, Cerro |
| 33 Philipp Camp | 23 Turumiquire, Cerro |
| 32 Ptari-tepui, Cerro | 28 Uaipán-tepui, Cerro |
| 14 Puerto Cabello | 34 Uei-tepui, Cerro |
| | 7 Valle (Mérida) |

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF SOME UNDESCRIBED FORMS
BELONGING TO TWO LITTLE KNOWN
SPECIES OF THE FAMILY APHIDIDAE

BY F. C. HOTTES

The opportunity is taken to describe several hitherto unknown forms belonging to two little known species of Aphididae and to record some observations concerning their life habits.

Macrosiphum macrosiphum (Wilson).

Alate male.

This form is described from two specimens. Size and general color.—Length from vertex to tip of anal plate 1.04-1.33 mm. Head, first two antennal segments and the prothorax dusky brown with some areas slightly lighter in color, areas around the base of the hair slightly raised and clear. Meso and metathorax on the dorsum rich dark brown with some areas almost black, sides of thorax with some yellow and green. Abdomen rich yellow with dusky markings as follows: four small dark dusky areas or patches on the sides anterior to the cornicles, two rows of lighter dusky areas on the dorsum extending inwardly from the first three lateral spots; just anterior to the cornicles there is an irregular dusky spot which is more or less band-like; posterior to the cornicles there are two rather broken bands of the same dusky color. The cornicles are dusky brown, posterior to their origin the abdomen is dusky brown. The anal plate is dusky, the cauda is more or less yellowish with dusky margins and setulose structures. The antennae are dark dusky brown except for the extreme base of III which is lighter in color. Antennal segment III is darker than the remaining segments. Segments III, IV and V of the rostrum are dusky brown with the tip and margins almost black. Femora yellow at the base shading gradually to light dusky at the apex. Tibiae light dusky with basal and apical portions darker. Tarsi concolorous with apex of tibiae. Gonapophyses dark brown.

Head and appendages.—Antennal tubercles well developed. Vertex with a well developed median tubercle. First antennal segments slightly gibbous on median surface. The gibbous portion of the first antennal segment is slightly rough. Antennal segments with the following proportional lengths: III .715-.772 mm., IV .54-.60 mm., V .58-.60 mm., VI .11-.14 mm + 1.00-1.31 mm. Secondary sensoria on segments III, IV, and V distributed as follows: III 47-53, IV 22-26, V 20-27. On III the sensoria are quite evenly distributed over all but the anterior surface. On this segment the sensoria are uniform in size and slightly tuberculate. Segment IV has the sensoria irregularly arranged, on this

segment the base is almost free from sensoria. From the middle of the segment towards the apex the sensoria are spaced closer and closer together till at the apex they are very much crowded together. Segment V has the sensoria in more or less of a row and like those on IV they are crowded near the apex. III and IV are slightly imbricated, V and VI are distinctly so. Hair on antennae fine, sparse and less than half the width of segment in length. The rostrum fails conspicuously to reach the coxae of the mesothoracic pair of legs in one case, and almost reaches them in the other.

Thorax.—The forewings of one specimen are missing, and the wings of the other specimen are poorly mounted, hence the only statement that may be made regarding the veins is that they are dark brown and more or less bordered with fuscous. Length of hind tibiae 1.14-1.28 mm. Length of hind tarsi .114-.128 mm.

Abdomen.—Cornicles typical of species in shape, in length .856-.886 mm. very slightly imbricated, the imbrications being better developed at the base and for the most part lacking on the apical fourth, Cauda .143-.151 mm. not constricted. One specimen shows two hairs on one side and one on the other, the other specimen shows the sides of the cauda provided with three and four hairs, the hairs on the cauda are long, fine, and sharply pointed. The anal plate is narrow and carries a row of hair on its outer margin. The gonapophyses appear to be further forward than usual, they are short and well provided with hair.

Oviparous female. Wilson confines his description of this form to the color. Size and general color.—Average length from vertex to tip of anal plate 1.69 mm., range in length from 1.53-1.89 mm. Width of head across eyes .34-.38 mm. Color uniform yellow to light yellowish-tan, except as follows: gibbous portion of first antennal segment; apical portion of III and basal and apical portions of IV and V and all of six light dusky to light brown. Basal and apical portions of tibiae and all of tarsi light dusky. Cornicles with apical portions dusky and sometimes entirely so. Cauda light dusky or if not the setulose surface alone is.

Head and appendages.—Antennal segments with the following comparative lengths: III .70-.74 mm., IV .45-.62 ave. .52 mm., V .38-.64 ave. .54 mm., VI .14-.15 mm. + .57-1.28 ave. .74 mm. Secondary sensoria confined to third antennal segment and never more than one. The rostrum extends beyond the coxae of the mesothoracic pair of legs but fails to reach those of the metathoracic pair.

Thorax.—The hind tibiae vary in length from 1.35-1.43 mm., the hind tarsi vary from .10-.12 mm. About the basal third of the hind tibiae is very slightly swollen and provided with sensoria, which are very difficult to distinguish.

Abdomen.—The cornicles are typical of the species and vary in length from 1.14-1.28 mm., with the average slightly less than 1.20 mm. The cauda varies in length from .214-.286 mm. and averages .26+ mm. The cauda is not constricted, its sides are uniform and carries from two to three hair on a side and as a rule one on the dorsum near the apex. Its surface is very finely setulose. The anal plate is well rounded, has a setulose surface and carries long pointed hair on its outer margin. About midway between the cornicles and the end of the anal plate the abdomen is considerably narrowed.

Allotype alate male, Skyway, Colorado, September 14, 1948. Morphotype oviparous female Skyway, Colorado, September 14, 1948. Both were taken on *Amelanchier alnifolia*. Both deposited in United States National Museum.

Wilson described the apterous viviparous female and what he supposed to be the male in the *Canadian Entomologist*, Volume 44, pp. 155-156, 1912. He placed the species in the genus *Illinoia*. I described the alate viviparous female in the PROCEEDINGS OF THE BIOLOGICAL SOCIETY OF WASHINGTON, Volume 47, pp. 7-8, 1934. I placed the species in the genus *Adactynus*. Wilson described the species as occurring in small colonies. I have only taken it solitary on the under sides of the leaves. My experience indicates that it is a very rare species.

Macrosiphum rudbeckiarum (Cockerell).

In 1903, Professor Cockerell, then residing in New Mexico, described from *Rudbeckia ampla* an aphid to which he gave the name *Nectarophora rudbeckiarum*. Since that time the species seems to have been recorded only in literature. I have been familiar with this species since 1930 and take this opportunity to describe all forms and to record some notes concerning its life history and its possible relationship to another species.

Alate viviparous female.

Size and general color.—Length from vertex to tip of anal plate 2.51-3.47, ave. 3.02 mm. Width of head across eyes .54-.57 mm. Head and prothorax light dusky brown. Mesothorax and metathorax brown with darker markings. Abdomen green with a darker median stripe. First antennal segment light dusky with inner margin light brown. Antennal segments II, III, IV, and V light dusky with basal portions of IV and V and apical portions of III, IV, and V darker. VI brown. Femora light dusky with dorsal portion darker. Tibiae light dusky with apical portions light brown, tarsi light brown concolorous with apex of tibiae. Cornicles pale to light dusky, cauda and anal plate the same, cauda with darker setulose surface. Veins of wings brown with a suggestion of a light dusky border.

Head and appendages.—Antennal segments with the following proportional lengths: III 1.02-1.17 mm., IV 1.10-1.24 mm., V .97-1.14 mm., VI .214-.228 mm. + 1.43-1.60 mm. Secondary sensoria confined to the third antennal segment, numbering from 16-33 average 22. The sensoria are arranged in more or less of a regular row, any irregularity occurring near the basal portion. The sensoria fail to reach the apical portion of the segment by a distance equal to a little less than the combined lengths of I and II. The sensoria are large and have wide rims, those on the basal half are somewhat oval, the others are round. The surface of III and IV is smooth, segment V is slightly imbricated and VI is distinctly so. On III the hair are for the most part slightly shorter than the width of the segment, they are rather coarse and sharp pointed. The rostrum reaches the coxae of the mesothoracic pair of legs, its tip is almost black, segments III and IV are light dusky. There is a median tubercle on the vertex.

The Thorax.—The metathoracic tibiae are 3.43 mm. long. The tarsi of this pair of legs are .10-.185 mm. long. The hair on the hind tibiae are rather coarse and sharp pointed. In length the hair near the basal portion are shorter than the width of the segment while those near the apex are slightly long than the width of the tibiae at this point.

There are no lateral tubercles on the thorax or abdomen. The stigma is pale dusky and has a scale-like surface. Under the stigma there is a faint accessory vein. The radial sector is considerably bowed. The second branch of the media is closer to the margin of the wing than it is to the first branch. All veins are very lightly bordered and none reach the margin of the wing.

The Abdomen.—The cornicles are 1.14-1.43 mm. long. Approximately .17 mm. of the cornicle at the apex is covered with closed reticulations. The surface of the cornicle not reticulated is imbricated and it is difficult to determine where the imbrications stop and the reticulations begin. The reticulated portion of the cornicle is very slightly narrower than the portion just above. The abdomen has a few rather long sharp pointed hair. The cauda is .53-.54 mm. long, it is not constricted and has a setulose surface. The cauda has five or six lateral hair. The anal plate is small for an aphid of this size and well rounded.

Apterous viviparous female.

Size and general color.—Average length from vertex to tip of anal plate 3.54 mm., the range is from 2.93-3.93 mm. Half of the females measured have a length of 3.86 mm. or more. Head, thorax, and abdomen light green with the head and first two antennal segments somewhat lighter in color, often very light, abdomen with a darker median stripe. Antennal segments III, IV, and V pale to light dusky, the apical portions darker. Segment VI brown. Some specimens will have antennal segments IV and V dusky brown. Segments IV and V of the rostrum dusky brown. Femora pale greenish. Tibiae pale greenish except for the region near the apex which is light dusky. Tarsi brown. Specimens of this form taken in the fall will have the antennae and legs darker than specimens taken in the summer. Cornicles pale green with the reticulated area light dusky. Fall forms may have the cornicles pale dusky with the apex much darker. Cauda and anal plate pale green.

Head and appendages.—Width of head across eyes .57-.60 mm. The antennal tubercles are very well developed, each tubercle has two hairs directed inwardly. The vertex has a well developed median tubercle. There are two hairs on the anterior margin of the vertex and rarely three. Comparative lengths of antennal segments as follows: III 1.02-1.28 ave. 1.17 mm., IV .91-1.28 ave. 1.18 mm., in only two cases out of eight taken at random was antennal segment IV shorter than III. V 1.00-1.14 ave. 1.04 mm., VI .214-.286 ave. .245 mm., + 1.28-1.71 ave. 1.44 mm. Secondary sensoria confined to third antennal segment, numbering from four to ten, most common number seven to nine. The hair on segment III are for the most part as long as the segment is wide, the hair are blunt at the tip but not enlarged. III is smooth, IV is smooth for the basal half and lightly imbricated for the remainder, V is moderately imbricated and VI is very much imbricated. The rostrum extends just beyond the coxae of the mesothoracic pair of legs.

Thorax.—The hind tibiae measure from 3.14-4.07 mm. long and average 3.70 mm. The hind tarsi are .17+ mm. long. There are no lateral tubercles on the thorax.

Abdomen.—The abdomen is without lateral tubercles. The cornicles measure from 1.14 in only one case to 1.64 mm. in length. The average length of the cornicles is 1.52 mm. Approximately .17 mm. of the

cornicle at the apex is reticulated, the remainder of the cornicle is imbricated. The base of the cornicle is very broad, the remainder of the cornicle is almost straight. The cauda is rather broad and spatula-shaped, it is not constricted and carries its width well towards the apex, which is not sharply pointed. There are from four to six hairs on a side, the entire surface of the cauda is setulose. In length the cauda varies from .57-.71 mm. The average length of the cauda is .67 mm. *Apterous oviparous female.*

Size and general color.—Length from vertex to tip of anal plate 2.93-3.50, average length 3.21 mm. Head, thorax, and abdomen similar to that of apterous viviparous female. Antennal segments, legs and cornicles as a rule darker than those of summer apterous viviparous females, and at times much darker, at such times approaching brown.

Head and appendages.—Average width of head across eyes .54 mm. varying from .52-.57 mm. Comparative lengths of antennal segments as follows: III .92-1.14 ave. 1.07 mm., most common length 1.14 mm., IV, .92-1.10 ave. 1.03 mm. IV was equal to III in two cases. V .80-.95 ave. .90 mm., VI .17-.21 + 1.000-1.43 ave. 1.28 mm. Secondary sensoria limited to III and numbering from five to nine, with five the most common number. As a rule there is considerable difference in size of the sensoria which are arranged in a row, on the basal half of the segment. The rostrum commonly extends slightly beyond the origin of the mesothoracic coxae, but two specimens were noted where the rostrum was much shorter.

Thorax.—The hind tibiae vary in length from 2.78-4.07 and average 3.41 mm. The hind tibiae are only slightly swollen and this occurs in a very short distance. In the swollen area and extending slightly beyond, there are about twenty sensoria. The hind tarsi are approximately .17 mm. long.

Abdomen.—The cornicles are similar to those of the viviparous females, except that the imbrications are less well developed. The anal plate and the cauda are similar to these structures in the apterous viviparous female. The apex of the abdomen is but little drawn out, unlike that of most oviparous females.

Alate male.

Size and general color.—The length from vertex to tip of anal plate varies from 1.40-1.78, the average length is 1.65 mm. As a rule the length is more than 1.70 mm. Width of head across eyes varies from .34-.58 mm., average width of head .46 mm. Head dusky with darker brown markings. Antennal tubercles with some greenish-yellow. Median portion of thorax brown with a small amount of black, remainder of thorax green. Abdomen green with a yellowish cast except as follows: three lateral dusky brown patches anterior to the cornicles, small dusky patch surrounding the base of the cornicles; dorsum of abdomen with two rows arranged on three segments of dusky brown to brown areas the second, third rows more or less confluent in the median section. Some specimens have a large dusky brown saddle which overlaps the sides in place of the lateral and dorsal patches. Cornicles pale to light dusky except for the reticulated portion which is dusky. Cauda dusky green. Antennae almost uniform dusky except for one and two and the base of three which are dusky yellow. Femora pale at the base shading to brown at the apex. Tibiae light dusky with the apical portions and

the tarsi brown. Stigma dusky with a brownish accessory vein beneath. Veins brown surrounded by a light dusky border. Margin of wing light smokey distinctly darker than the more median portion of the wing.

Head and appendages.—Antennal tubercles well developed. Vertex with a median well developed tubercle. Antennal segments with the following proportional lengths: III .78-1.14 ave. 1.03 mm. Most specimens will show III longer than average. IV .85-1.17 ave. 1.07 mm. In six cases out of nine taken at random IV was longer than III and equal to III in another. V .85-1.04 ave. .94 mm., VI .21-.24 mm. + 1.07-2.02 ave. 1.74 mm. Secondary sensoria distributed as follows: III 94-119 covering most of surface except for basal and apical regions, the sensoria are uniform in size and have wide rims; IV has from 55-73 sensoria and they appear to cover about three sides of the segment; V has from 27-35 sensoria and on this segment they are for the most part confined to one side of the segment and are closer together near the apex. On III the hair are shorter than the width of the segment and sharp pointed. The rostrum reaches just beyond the mesothoracic coxae.

Thorax.—The second branch of the media is closer to the first branch than it is to the margin of the wing. The radial sector is long and little bowed. The outer portion of the wing is quite rough as though covered with scales. The hind tibiae are 2.35-2.64 mm. long and average 2.51 mm. The most common length of the tibiae is 2.57 mm. The hind tarsi measure .143 mm. in length.

The Abdomen.—The cornicles are from .54-.74 mm. long and average .62 mm. They are reticulated near the apex for a distance of about .1 mm. The cauda varies in length from .21-.24 mm., it has from four to five lateral hair. The gonapophyses are dark brown and quite similar to those of other males.

The host upon which I took all forms of this species from the stem mothers in the spring to the sexes in the fall was *Rudebeckia montana*, a composite which lacks the ray flowers, and it was this that attracted me to it in 1930 when I collected the first specimens from it. The aphids show a preference for the under sides of the leaves. This is especially true of the sexual forms. The alate viviparous forms, if there are any, seem to prefer the flower stem directly under the disk. The immature forms of this species are often pale cream to pale yellow. In the fall immature forms are apt to show a slight frost-like pulverulence. Alate forms of this species key to *Macrosiphum laevigatae* Essig in all keys known to me. I so determined it for many years until Prof. Palmer called my attention to Prof. Cockerell's description. In 1947 and again in 1948 I was able to follow the complete life cycle on *Rudebeckia* so I have positive proof that the species need not migrate to a secondary host, although I lack proof that it does not. During the summer of 1948 I tried to colonize apterous viviparous females from *Rudebeckia* on *Salix* from which I had collected *Macrosiphum laevigatae* without success. I also tried to colonize apterous *laevigatae* on *Rudebeckia* from June 6 to July 13, after which I could no longer locate *laevigatae* on *Salix*. (Prof. Palmer informs me that she has records of *Macrosiphum laevigatae* on Willow taken August 14, 20-31.) In every case my attempts ended in failure. Another year I shall

attempt similar transfers making use of alate forms which should be the more normal transfer agents, but these were not available in 1948 when only one alate *rudbeckiarum* was seen and only two alate *laevigatae* collected although many pupae of this species were seen on July 13. *Macrosiphum laevigatae* taken from *Salix* has a shorter cauda than *Macrosiphum rudbeckiarum* and also has fewer sensoria, 13-14, to 16-33 in *rudbeckiarum*. In other anatomical features *laevigatae* is as a rule smaller than *rudbeckiarum* but smaller forms of *rudbeckiarum* will be found to agree except for cauda and sensoria better with *laevigatae* taken on *Salix*.

Until we know more about these seldom-taken forms, it will be well to hold them distinct. On September 14, 1948, I took apterous oviparous females of this species on the under sides of the leaves of *Rubus* sp. At the time I collected them on *Rubus* they were mixed in with a species belonging to the genus *Amphorophora* and it was this species alone that I thought I was collecting. Of this I am positive, and there was no mix-up of species.

Allotype alate male September 3, 1947. Morphotype apterous viviparous female June 25, 1948. Morphotype apterous oviparous female September 14, 1948. (Taken in copulation with male mounted on same slide.) All types deposited in the United States National Museum. Paramorphotypes also taken on the following dates: July 1930, July 1932, June 25, 1948, July 13, 1948, September 3, 1948, September 14, 1948.

All taken on *Eudebeckia montana* near Skyway, Colorado.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF THE SEXUAL FORMS OF SOME
SPECIES OF APHIDIDAE

F. C. HOTTES

Here follow the descriptions of the sexual forms of some of the aphid species described by the author.

Kakimia wahinkae (Hottes).

Alate male.

Size and general color.—Average length from vertex to tip of anal plate 1.78 mm. Range of size from 1.36-2.02 mm. Head and thorax shiny dark dusky-brown, to almost black. Abdomen dark green with dusky markings at the sides and five more or less broken bands on the dorsum. Head thorax and abdomen with a metallic sheen or luster. Cornicles light dusky. Anal plate and cauda dusky brown with some green in the lighter colored areas. First two antennal segments dark brown, third antennal segment dusky brown, somewhat lighter near base. Fourth and fifth antennal segments lighter in color than the third, darker towards the apex. Base of sixth antennal segment lighter than the remainder which is light dusky. Femora greenish at base becoming dusky brown towards the middle and dark brown to almost black distally. Tibiae brown with apical portions almost black. Tarsi dark brown to black. Veins of fore and hind wings dark brown bordered with fuscous. Gonapophyses dark brown.

Head and appendages.—Average width of head across eyes .46 mm. Ocular tubercles present but small. Antennal segments with the following proportional lengths: III .54-72 ave. .62 mm., IV .31-41 ave. .36 mm., V .24-31 ave. .27 mm., VI .1+.68-.85, ave. .76 mm. Secondary sensoria on antennal segments III, IV and V, arranged as follows: III 42-57, as a rule more than 52; IV 9-12; V 8-15, as a rule more than 12. On III the sensoria are irregularly arranged and cover most of the surface except the extreme base and for a short portion near the apex. On III the sensoria vary in size, are without a rim, and are little if any tuberculate. On IV the sensoria are irregularly arranged but the anterior surface is free, the sensoria on the apical portion are more or less in a row. On V the sensoria are almost in a straight row. Hair on the antennae is sparse, fine and sharp-pointed, on III it is slightly shorter than the width of segment. III and IV are lightly imbricated, V and VI are well imbricated. The first antennal segment is slightly gibbous on the inner margin. The anterior margin of the head carries a well developed median tubercle. The rostrum reaches the coxae of the mesothoracic pair of legs.

Thorax and appendages.—The first branch of the media is closer to the margin of the wing than it is to the origin of the first branch. The

stigma is dark and has a scale-like surface. Tibiae long rather thin. Hair on tibiae rather coarse, sharp-pointed and about as long as width of tibiae. First tarsal segment apparently with only two hair.

Abdomen.—The cornicles vary in length from .12-.14 mm. In shape they are similar to those of the viviparous females, they are lightly imbricated. Hair on abdomen apparently confined to dusky areas, or arising from small dusky elevations not much wider than the hair itself. The hair on the abdomen is fine and sharp-pointed, very much unlike that found on the abdomen of the female. The cauda is from .12-.15 mm. long, it is wide throughout, it has three lateral hairs and two on the dorsum. All hairs arise posterior to the middle. The gonapophyses are very hairy.

Oviparous female.

Size and general color.—Length from vertex to tip of anal plate 1.79-2.32 mm. ave. 2.08 mm. Color similar to that of apterous viviparous female. In a few females the eggs show through the surface of the body as lighter colored areas. Average width of head through the eyes .45-.52 mm.

Head and appendages.—Antennal segments with the following comparative lengths: III .48-.65 ave. .52 mm., IV .27-.38 ave. .31 mm., V .22-.28 ave. .25 mm., VI .1+ .64-.78, most common length .64 mm. Secondary sensoria on III 8-19, most common number 12. On this segment the sensoria are confined to the basal half of segment, they are located only on one side of the antenna, are small and quite tuberculate. There are no secondary sensoria on the third or fourth antennal segments. On the third antennal segment the hair are sparse, sharp-pointed, and for the most part longer than the width of the segment. Segments III and IV are lightly imbricated, segments V and VI are conspicuously so. The front of the head has a well developed rather square shaped median tubercle. The rostrum almost reaches the coxae of the meta-thoracic legs. The hind tibiae have the basal halves much swollen, sensoria occupy this area and extend downwards past the middle of segment. The sensoria are irregular in shape and size. The hair on the swollen portion of the tibiae is less abundant than it is on the lower portions.

Abdomen.—The cornicles and cauda as in the viviparous female. The tip end of the abdomen is somewhat drawn out.

The males and the oviparous females were taken near Skyway, Colorado, on the underside of the leaves and on the seed pods of *Aconitum columbianum*. The complete life history of this species may be followed on this host.

Allotype alate male, taken near Skyway, Colorado, August 18, 1948. Morphotype apterous oviparous female taken near Skyway, Colorado, August 23, 1948. Other sexuals belonging to this species were taken August 3 and on August 11 in the same locality. At the time I described the viviparous forms I remarked at the difficulty of placing this species in a genus. It is just as difficult to do so now. Both the allotype male and the morphotype oviparous female have been placed in the United States National Museum.

Macrosiphum yagasogae.*Alate male*.

Size and general color.—This form is described from two specimens taken with several oviparous and viviparous females. Length from vertex to tip of anal plate 1.52-1.78 mm. Width of head through eyes 50 mm. Head dusky brown with the antennal tubercles lighter. Prothorax concolorous with head meso and metathorax brownish-black on the dorsum and venter, later surfaces dark green. Abdomen dark green with dusky brown spots on the sides. Dorsum of abdomen with much dusky brown in the form of irregular patches, portion of abdomen posterior to cornicles with more dusky brown than green. Cornicles uniform dusky. Cauda and anal plate pale dusky. Gonapophyses brown. First and second antennal segments somewhat lighter in color than the head. Third antennal segment dusky except at extreme base. Fourth antennal segment dusky growing darker towards the apex, fifth segment darker than the fourth, sixth segment dark brown. Rostrum pale green at base, terminal segments light dusky. Femora of all legs pale with a greenish cast basally and with the upper apical surface light dusky. Tibiae pale except for apical portions which are brown. Tarsi brown.

Head and appendages.—Antennal segments with the following proportional lengths: III .68-.77 mm., IV .61-.64 mm., V .68-.71 mm., VI .20-.22 mm. + 1.21-1.30 mm. The antennal tubercles are well developed. The secondary sensoria are distributed as follows: III 38-42, IV 0-2, V 20-22. On III the secondary sensoria are irregularly arranged but for the most part are confined to one side of the segment. On this segment the sensoria are irregular in size and have wide rims. If sensoria are found on IV they are beyond the middle of the segment. The basal portion of V is free from sensoria but once they begin they are almost in a straight row and placed closer and closer together till at the apex very little if any space separates them from one another. Antennal segments III and IV are lightly imbricated, segments V and VI are conspicuously so. The rostrum fails to reach the mesothoracic coxae. The dorsum of the head has two clear areas suggestive of sensoria.

Thorax.—The hind tibiae are 1.82 mm. long. The hind tarsi measure .157 mm. The stigma is long and thin, its surface is scale-like. An accessory vein is present beneath the stigma. The first branch of the media is midway between the second branch and the margin of the wing.

The abdomen.—The cornicles are .50 mm. long. The reticulations at the apex of the cornicles extend for a distance of .10 mm. The remaining portion of the cornicles is imbricated in a manner to suggest reticulations. The cauda is .171 mm. long, with from four to five hair on a side and from none to two on the dorsum, the cauda is not constricted. The anal plate is deep and quite narrow. The gonapophyses are shorter than usual and quite hairy.

Allotype male taken at Skyway, Colorado, September 10, 1948, on *Solomon's Seal Polygonatum commutatum*. Deposited in the United States National Museum. Dr. Frison and I described *Macrosiphum kickapoo* from material collected on the same host in Illinois. The two species show an unmistakable affinity but at the same time maintain their specific identity. This interesting relationship should be further investigated.

Kakimia tutigula (Hottes)*Alate male.*

Size and general color.—Average width of head through eyes .41 mm. Average length from vertex to tip of anal plate 1.72, range from 1.68-1.78 mm. Head dark dusky brown shading to almost black. Dorsum of thorax dark dusky brown to black, lateral portions of thorax lighter and somewhat green. Abdomen green with dusky brown patches along lateral margins and broken patches of the same color on the dorsum. Antennae with the exception of the extreme base of third segment uniform dusky. Rostrum dusky. Femora with base yellowish-green shading to dusky at the apex. Tibiae dusky at base and apex, remaining portion light dusky. Cornicles and cauda dusky. Gonapophyses almost black.

Head and appendages.—Antennal segments with the following comparative lengths: III .60-.81 ave. .71 mm., IV .51-.60 Ave. .55 mm., V .48-.52 mm., VI .15-.21 ave. .17 mm., + .60-.74 ave. .68 mm. Secondary sensoria on III irregularly arranged but confined for the most part to one side of the segment. The sensoria are irregular in size, have wide rims, and are very little if any tuberculate. The sensoria near the apex of III are few and confined to a row. On V the sensoria are arranged in an irregular row. The sensoria number as follows: III 49-69 ave. 58, V 20-28 ave. 23. All antennal segments are imbricated V and VI more so than the others. Hair on antennal segments fine, considerably shorter than the width of segment and very sparse. Ocular tubercles small. Rostrum short, failing to reach coxae of mesothoracic pair of legs.

Thorax.—First branch of media as a rule closer to margin of wing than to origin of second branch. Radial sector rather flat, being but little bowed. Stigma narrow. Hind tibiae long.

Abdomen.—Cornicles .20-.21 mm. long, imbricated. Cauda .18-.20 mm. long with from 2-3 hair on a side near the apex and from two to three hair on the dorsum. Gonapophyses very hairy.

Taken near Skyway, Colorado (region of Island Lake, type locality) September 10, 1948, on *Capnoides* sp. At that time there were no oviparous females. On September 17, following a killing frost, one immature oviparous female was taken. The slide bearing the allotype male has been deposited in the United States National Museum. *Kakimia tutigula* spends its whole life cycle on *Capnoides* sp.

PROCEEDINGS
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GEOGRAPHIC VARIATION IN THE RIBBED FROG,
ASCAPHUS TRUEI

BY M. B. MITTLEMAN AND GEORGE S. MYERS

In the Pacific Northwest, from British Columbia and Montana to northern California, occurs the most remarkable of North American frogs. *Ascaphus truei* Stejneger is not only the most primitive New World frog, but it also possesses a tadpole unique among Nearctic Salientia. Heretofore, but a single named population has been recognized within the genus *Ascaphus*. While it is the primary purpose of this paper to demonstrate the existence of three recognizable populations of *Ascaphus*, a brief historical and systematic introduction appears to be useful.

The Ascaphidae, as recognized by Noble (1931: 485, where called Liopelmidæ), include but two genera, *Leiopelma* and *Ascaphus*. The first-known genus, *Leiopelma*¹, is restricted to New Zealand, from whence three forms have been described: *L. hochstetteri* Fitzinger, *L. hamiltoni* McCulloch, and *L. archeyi* Turbott. The primitive nature of *Leiopelma* was not at first understood, principally because of the then-rudimentary state of frog classification. Fitzinger (1861) compares the genus with *Telmatobius* and *Cyclorhamphus*, two neotropical genera now referred to the Leptodaectylidae. Steindachner (1867: 33) places *Leiopelma* in the "Bombinatoridae," a heterogeneous group assembled by Günther, and based chiefly on dentition, hymanum, and toe-webbing. Boulenger (1882: 447) appears to have been the first to recognize that *Leiopelma* belongs with the primitive, ribbed frogs, but his later denial of the presence of rudimentary ribs, and consequent placement of *Leiopelma* in the "Cystignathidae" (= Leptodaectylidae), in 1910 (p. 150, footnote), has never been properly explained. The work of Noble (1922) reinstated *Leiopelma* among the ribbed frogs, but he separated this genus and *Ascaphus* from the more advanced Discoglossidae, in which all the ribbed frogs had previously been placed (Noble, 1931: 485).

On the other hand, *Ascaphus*, unlike *Leiopelma*, was recognized as a primitive frog from the very first. The unique type specimen was obtained by Cloudsley Rutter of Stanford University, during the course of some ichthyological work he was doing for the U. S. Fish Commission

¹This generic name is spelled *Leiopelma* by most recent writers, following Boulenger (1882: 447). Myers and Carvalho (1945: 17, footnote 5) called attention to this error, although they did not have Fitzinger's original paper in hand. While the classically correct transliteration of the name would be *Liopelma*, Fitzinger (1861: 218) spelled it *Leiopelma*, and the International Rules require the retention of this orthography.

in western Washington State. The type was forwarded to Washington, probably to the headquarters of the Fish Commission, whence it was turned over to the National Museum. The specimen was described by Stejneger in 1899, as *Ascaphus truei*, and referred to the Discoglossidae. This discovery, the most important in Nearctic batrachology, led Stejneger to write his paper on the geographical distribution of the Discoglossids (1905).

For a number of years *Ascaphus* remained a very rare frog. However, as its habitat became known, more specimens became available, so that over the course of the fifty years since its original description *Ascaphus* has become a relatively well-known frog. As early as 1912, Van Denburgh published a detailed note on the skeletal anatomy, while Mrs. Gaige wrote at considerable length (1920) on the life-history and ecology, on the basis of her observations in the Olympic Peninsula. Noble (1922, 1931) published some notes on the life-history and breeding of the species from live material and information supplied by Phillips G. Putnam. The cranial anatomy has been investigated by de Villiers (1934), and a number of notes have been published by Storer (1925), Slevin (1928), Myers (1931, 1943), Smith (1932), the Wrights (1933, 1942), and at least 23 other writers.

Yet, despite these many contributions to a rapidly-growing literature, the morphological variations of *Ascaphus*—especially the extent and nature of these variations with respect to geographic distribution—remain scarcely known. In part, this doubtless arises from the fact that there are comparatively few adult (post-metamorphic) specimens in collections, and probably also because the habits of this animal are such that its range is still imperfectly known, with many gaps yet to be filled. Myers has suspected since 1931 that the California population of *Ascaphus* differs racially from that of Oregon and Washington, but before Mittleman knew of this he already had the present study well under way. He then invited his western colleague to assume joint authorship. All mensural and statistical treatments have been done by Mittleman, but the conclusions expressed herein, as well as the new names proposed, have been authored jointly.

A study of 65 post metamorphic and 166 larval specimens of *Ascaphus*, from all parts of the range of this species, indicates that it is composed of three vicarious races: the typical form, occurring in western Oregon and Washington; another race occupying the Northern Rocky Mountain Province in Idaho, Montana, and adjacent British Columbia; a third race restricted to a few counties in northern California. The differences among these three races are quantitative and/or meristic, and although in some cases they are slight in terms of absolute quantities, they are nonetheless of such a constant nature as to permit the positive separation of 88% of the post-metamorphic specimens studied. No qualitative differences have been found among the populations studied, nor do color or pattern provide useful dichotomous characters.

The distinguishing unitary traits of the three races are the number of vomerine teeth, and the relative dimensions of the eye and head width. No ontogenetic or sexual variations have been found in these characters, so that all tabulations and comparisons are made on the basis of post-metamorphic specimens of all ages and of both sexes.

VOMERINE TEETH

The vomerine teeth in *Ascaphus truei* vary from 1 to 17 per series. There is, as in most amphibians, a considerable variation in the number of teeth per series in individuals, e.g., there is often a considerable discrepancy in the number of teeth on one side, as compared to the other. Thus, in order to facilitate comparisons between individuals and populations, the tooth counts of both sides have been combined to yield a single count reflecting the total number of vomerine teeth in the specimen. The full range of variation in the combined vomerine counts of 52 post-metamorphic *Ascaphus* from all parts of the range of this species is as follows:

2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	N
f	4	4	2	3	3	3	2	3	7	3	3	2	2	2	2	51		1	1									1	52

Combined Vomerines

Examination of 13 adult specimens of *Ascaphus truei* from western Washington and Oregon shows that the combined vomerine counts vary from 8 to 30. Nine specimens from various southern British Columbia localities have a range of 8 to 21 teeth, while in 13 specimens from Idaho and Montana the spread is from 9 to 22. No significant statistical differences exist between any of these populations so far as the vomerine count is concerned. However, in 17 adult specimens from northern California, the combined vomerine count is much lower, as is also the range of variation, the observed spread being 2 to 8 teeth per specimen. The combined vomerine count is 7 or less in 16 out of 17 Californian specimens, but is 8 or more in all 35 specimens from Oregon, Washington, British Columbia, Idaho, and Montana. Hence, 51 specimens out of 52 (= 98%) can be identified as to a Californian or non-Californian provenance on the basis of the vomerine count alone. A chisquare value of 47.5 attests to the highly significant association between the combined vomerine count and geographic origin in these samples.

RELATIVE SIZE OF THE EYE

The diameter of the eye has been taken as the horizontal distance between the anterior and posterior junctures of the lids. Measurements were made with a vernier caliper under low-power (17 $\times$) binocular magnification. The ratio of the horizontal diameter of the eye to the snout-vent length (hereafter referred to as the eye/SV ratio) shows a small absolute variation, being in 60 specimens of *Ascaphus* from all parts of the range, as follows:

f	eye/SV ratio (%)
3	10.00 - 10.99
14	11.00 - 11.99
13	12.00 - 12.99
12	13.00 - 13.99
13	14.00 - 14.99
5	15.00 - 15.99

N = 60

As in the case of the vomerine counts, the eye/SV ratios show certain geographic variations. Thus, the 13 Oregon-Washington specimens vary from 11.2 to 13.0%; the British Columbia series shows a variation of 10.44 to 13.60%, while 14 specimens from Idaho and Montana show a range of 10.7 to 13.4%. The California population is again distinctive by virtue of having a proportionately larger eye, since the eye/SV ratio in 24 specimens varies from 12.5 to 15.9%. In 23 out of the 24 Californian specimens the eye/SV ratio is 13.6% or more, while in 35 specimens out of 36 from other areas this critical ratio is 13.5% or less. Thus, 58 out of 60 specimens (= 96%) can be identified as to a Californian or non-Californian origin on the basis of the eye/SV ratio.

However, the non-Californian specimens are not themselves homogeneous with respect to their eye/SV ratios. Although there is no perceptible difference between specimens from Oregon and Washington in the relative size of the eye, there is a discernable and significant trend toward a higher eye/SV ratio in specimens from Idaho, Montana, and British Columbia. Oregon and Washington specimens have ratios varying from 11.2 to 13.0%, with 10 out of 13 specimens from these states having ratios of 11.85% or less. In specimens from Idaho, Montana, and British Columbia the eye/SV ratio ranges from 10.44 to 13.60%, with 16 specimens out of 23 having a ratio higher than 11.85% (12.31% or more). A total of 26 specimens out of 36 (= 72%) in these two samples can be correctly separated as to their geographic provenance on the basis of the eye/SV ratio. The observed differences in the eye/SV ratios of these two populations are statistically significant (chi-square = 7.19).

RELATIVE HEAD WIDTH

The width of the head has been measured at the point of greatest breadth, immediately behind the eyes. Measurements were taken with a vernier caliper under 17X binocular magnification. The ratio of the head width to the snout-vent length (hereafter referred to as the HW/SV ratio) shows a moderate absolute variation, ranging from 32.5 to 42.6%, as follows:

<i>f</i>	HW/SV ratio (%)
2	32.00 - 32.99
5	33.00 - 33.99
7	34.00 - 34.99
5	35.00 - 35.99
6	36.00 - 36.99
3	37.00 - 37.99
7	38.00 - 38.99
8	39.00 - 39.99
8	40.00 - 40.99
5	41.00 - 41.99
4	42.00 - 42.99

N = 60

Each of the various samples discussed heretofore has a characteristic range of variation in its HW/SV ratio. Thus, Oregon-Washington specimens show a range of 32.5 to 39.4%, while British Columbia speci-

mens vary from 33.4 to 37.7%, and the Idaho-Montana samples show a spread of 34.2 to 39.4%. California specimens are again distinctive by virtue of having a relatively wider head, the range of the HW/SV ratio being 38.4 to 42.6%.

Despite apparently broad overlaps in the HW/SV ratios of the various samples, there are actually very significant differences in the relative head widths of the populations involved. Hence, 23 out of 24 California specimens have HW/SV ratios of 39.0% or more, while in 34 out of 36 non-Californian specimens the HW/SV ratio is 38.7% or less. These critical ratios will separate 57 specimens out of 60 (= 95%), as to a Californian or non-Californian origin. A chi-square value of 47.4 attests to the highly significant association between geographic provenance and proportionate head width.

In a similar vein, it is found that 11 out of 13 Oregon-Washington specimens have an HW/SV ratio of 35.2% or less, while 18 out of 23 specimens from Idaho, Montana, and British Columbia have ratios of 35.6% or more. Again, with 29 specimens out of 36 (= 80.5%) being geographically identifiable on the basis of their HW/SV ratios, the significant association between this ratio and geographic origin is reaffirmed (chi-square = 13.3).

LARVAE

Despite the differences existing among the several populations of *Ascaphus truei*, as discussed heretofore, the larvae are remarkably stable in size, proportions, color, pattern, and tooth-row counts. In fact, it has not been possible to determine any dichotomous differences in tadpoles from widely separated parts of the range of the species (*sensu lato*).

Authors who have had occasion to discuss the larvae of *Ascaphus truei* have described the tooth rows as being 3/10, except Smith (1932: 100), who reports a specimen from St. Regis Pass, Montana as having the tooth rows 3/9. Careful study of 123 larvae from all parts of the range of *Ascaphus* shows that the tooth count is either 3/11 or 3/12. The last lower rows, where they encroach on the lower (posterior) lip are exceedingly minute, and occasionally are imperfect. Nonetheless, careful examination under relatively low magnification (25.5X) will reveal these teeth.

Counts of 11 or 12 lower tooth rows occur with approximately equal frequency throughout the range of *Ascaphus*, as will be seen in the following tabulation:

Lower Tooth Rows			
Locality	11	12	Total
California	12	9	21
Washington	6	0	6
Idaho	1	0	1
Montana	33	39	72
British Columbia	10	13	23
	62	61	123

There is no perceptible correlation or association between tooth-row counts and size in *Ascaphus* larvae. The full range of size variation (overall length, snout to tip of tail) observed in larvae is from 15 mm.

(Park Creek, Glacier National Park, Mont.), to 60 mm. (Ole Creek, Glacier National Park).

From our studies of the several populations discussed here, we conclude that *Ascaphus truei* is a polytypic species composed of three annectant, vicarious races. The population inhabiting the northern parts of the Cascade-Sierra Province and the Pacific Border Province in Oregon and Washington is indistinguishable from Stejneger's type of *truei* (USNM 25979, Humptulips, Grays Harbor Co., Wash.), whereas the population occurring in the southern parts of these Provinces (in Del Norte, Siskiyou and Humboldt counties, Calif.) is markedly different, as is also the form which ranges through the Northern Rocky Mountains Province in Idaho, Montana (probably also extreme eastern Oregon and Washington), and adjacent British Columbia. Accordingly, we restrict the name *truei* to the western Oregon-Washington population, and propose that the other two forms be recognized as subspecies. Our definition of *truei*, and descriptions of the two new races follow.

Ascaphus truei truei Stejneger

- 1899 *Ascaphus truei* Stejneger, Proc. U. S. Nat. Mus., 21: 900, pl. 39. Type locality: Humptulips, Grays Harbor (formerly Chehalis) County, Wash.; Dickerson, 1906, Frog Book, p. 51; Van Denburgh, 1912, Proc. Calif. Acad. Sci., 4 (3): 259; Camp, 1917, Copeia: 13; Stejneger and Barbour, 1917, Check-list N. Amer. Amph. Rept., p. 25; *ibid.*, ed. 2, 1923, p. 22; *ibid.*, ed. 3, 1933, p. 25 (*part.*); *ibid.*, ed. 4, 1939, p. 28 (*part.*); *ibid.*, ed. 5, 1943, p. 36 (*part.*); Gaige, 1920, Occ. Pap. Mus. Zool. Univ. Mich., 84: 1; Van Winkle, 1922, Copeia: 4; Noble, 1922, Copeia: 4; Storer, 1925, Univ. Calif. Publ. Zool., 27: 143 (*part.*); Slevin, 1928, Occ. Pap. Calif. Acad. Sci., 16: 79 (*part.*); Slater, 1931, Copeia: 62; Noble and Putnam, 1931, Copeia: 97; Svihla and Svihla, 1932, Copeia: 38; Svihla and Svihla, 1933, Copeia: 37; A. Svihla, 1933, Copeia: 39; Wright and Wright, 1933, Handbook of Frogs and Toads, p. 36 (*part.*); *ibid.*, ed. 2, 1942, p. 44 (*part.*); Slater, 1934, Copeia: 140; Graf, Jewett, and Gordon, 1939, Copeia: 102.

Diagnosis: Combined vomerines 8-30; eye/SV ratio 11.2-13.0% (11.85% or less in 77% of specimens); HW/SV ratio 32.5-39.4% (35.2% or less in 85% of specimens).

Range: Oregon and Washington, in the Cascade-Sierra and Pacific Border Provinces.

Specimens studied: 48, as follows:

OREGON

Curry County: N. side of Rogue River, 11. mi. above mouth (MVZ² 17162).

Klamath County: Castle Creek, Crater Lake Nat. Pk. (SU 3920); Copeland Creek, Crater Lake Nat. Pk. (USNM 95230-1); Bybee Creek, Crater Lake Nat. Pk. (USNM 95226-9).

²Abbreviations for collections: MVZ = Museum of Vertebrate Zoology; SU = Natural History Museum, Stanford University; USM = United States National Museum; CNHM = Chicago Natural History Museum; CAS = California Academy of Sciences; PMBC = Provincial Museum of British Columbia; ROMZ = Royal Ontario Museum of Zoology.

WASHINGTON

- Chelan County*: Icicle Creek (USNM 103708; 3 spec.).
Clallam County: Olympic Hot Springs (CNHM 27117-8).
Grays Harbor County: Humptulips (USNM 25979, TYPE).
Jefferson County: Mt. Steel (USNM 63387); Dosewallips River (USNM 64345).
Lewis County: Tilton River (CNHM 27119; 2 spec.).
Mason County: Staircase Camp (MVZ 8497-8); McTaggart Creek (USNM 67121-3; 63388-90); Laundry Creek (USNM 67120).
Pierce County: Mt. Rainier (USNM 62434, 62436, 62438, 62450); Tacoma Creek (USNM 104423-4); Stevens Creek (USNM 104425); Nickel Creek (USNM 104426).
Snohomish County: No locality (CNHM 41298; 2 spec.).
Yakima County: Outlet of Dewy Lake, S. of Naches Pass (SU 9285-7).
 No specific locality: "Western Washington" (SU 3091-5, 3761; 3 spec.).

Ascaphus truei californicus, n. ssp.

- 1917 *Ascaphus truei* Grinnell and Camp, Univ. Calif. Publ. Zool., 17: 140; Stejneger and Barbour, 1923, Check-list N. Amer. Amph. Rept., p. 22 (*part.*); *ibid.*, ed. 3, 1933, p. 25 (*part.*); *ibid.*, ed. 4, 1939, p. 28 (*part.*); *ibid.*, ed. 5, 1943, p. 36 (*part.*); Storer, 1925, Univ. Calif. Publ. Zool., 27: 143 (*part.*); Slevin, 1928, Occ. Pap. Calif. Acad. Sci., 16: 79 (*part.*); Myers, 1931, Copeia: 56; Wright and Wright, 1933, Handbook Frogs and Toads, p. 36 (*part.*); *ibid.*, ed. 2, 1942, p. 44 (*part.*); Shapovalov, 1937, Copeia: 234; Wood, 1939, Copeia: 110; Myers, 1943, Copeia: 126.
Diagnosis: Combined vomerines 2-8 (7 or less in 94% of specimens); eye/SV ratio 12.5-15.9% (13.6% or more in 96% of specimens); HW/SV ratio 38.4 to 42.6% (39.0% or more in 96% of specimens).
Range: Del Norte, Humboldt, and Siskiyou counties, California.
Holotype: MVZ 19142 ♀, near Klamath, Del Norte County, Calif.; collected by W. F. Wood, November 4, 1933.
Paratypes: See list of specimens studied.
Specimens studied: 50, as follows:

CALIFORNIA

- Del Norte County*: Klamath (CNHM 31909); Wilson Creek, near Klamath (CNHM 31912); tributary of Wilson Creek, 8.5 mi. N. of Klamath (MVZ 29790 3, 29795, 29797-8, 29801-3); 8 mi. NE of Crescent City (CAS 80135).
Humboldt County: Ascaphus Creek, 0.5 mi. N. of road to Holmes, on Redwood H'way (SU 7371-2, 7390-9); Prairie Creek, 11 mi. N. of Orick (CNHM 31910-11); 8.6 mi. N. of Weott (SU 4636-42); near Scotia (USNM 93779; 4 spec.); 10 mi. N. of Orick (CAS 80159-62); 10 mi. W. of Orick (CAS 78812-3).
Siskiyou County: French Creek (SU 2190); "Siskiyou Mts." (USNM 45362); Mill Creek Park (CAS 81297-300).

Remarks: While it may seem strange that a political boundary, the California-Oregon line, should separate two races (*truei* and *californicus*), it should be pointed out that this particular political boundary is, to some extent, a biogeographical one as well. The Siskiyou Moun-

tains and associated ranges, which rise along the state line, form a barrier which can be seen in the distribution of a number of animal populations. These mountains delimit the northern range of *Batrachoseps* and of *Aneides flavipunctatus* (see Myers and Maslin, 1948, Proc. Biol. Wash., 61: 127), and come very close to marking the division between the subspecies of *Bufo boreas* and *Rana aurora*. It may be noted that these mountains limit the southward extension of *Rana pretiosa* (west of the Cascade-Sierra range), and the northward extension of *Scaphiopus* in the Sacramento Valley. In addition, this natural barrier seems to mark a subspecies boundary in *Triturus granulosus*, and *T. rivularis* is not known to penetrate it from the south.

***Ascaphus truei montanus*, n. ssp.**

- 1932 *Ascaphus truei* Smith, Copeia: 100; Stejneger and Barbour, 1933, Check-list N. Amer. Amph. Rept., p. 25 (*part.*); *ibid.*, ed. 4, 1939, p. 23 (*part.*); *ibid.*, ed. 5, 1943, p. 36 (*part.*); Wright and Wright, 1933, Handbook Frogs and Toads, p. 36 (*part.*); *ibid.*, ed. 2, 1942, p. 44 (*part.*); Linsdale, 1933, Copeia: 223; Donaldson, 1934, Copeia: 184; Ricker and Logier, 1935, Copeia: 46; Slater, 1941, Occ. Pap. Coll. Puget Sound, 14: 85; Rogers and Jellison, 1942, Copeia: 10; Slipp and Carl, 1943, Copeia: 127; Carl and Cowan, 1945, Copeia: 52.

Diagnosis: Combined vomerines 8-22; eye/SV ratio 10.44-13.60% (12.31-13.60% in 70% of specimens); HW/SV ratio 33.4-39.4% (35.6 — 38.6% in 74% of specimens).

Range: The Northern Rocky Mountains Province in Idaho, western Montana, probably extreme eastern Oregon and Washington, and adjacent British Columbia.

Holotype: USNM 102505 ♂, tributary of Lincoln Creek, Glacier National Park, Flathead County, Montana; collected by Leonard P. Schultz.

Paratypes: See list of specimens studied.

Specimens studied: 122, as follows:

IDAHO

Adams County: 0.5 mi. E. of Black Lake, 6000 ft. (MVZ 12340-3; 12345).

Beneviah County: East Fork of Charley Creek, near Emida (CNHM 43583).

Washington County: 1.0 mi. NE of Heath, on SW slope of Cuddy Mt., 4000 ft. (MVZ 12344, 12336).

MONTANA

Flathead County: Midvale Creek, near Glacier Nat. Pk. (Univ. Wash., 2 spec.); Tributary to Lincoln Creek, Glacier Nat. Pk. (USNM 102506-7); Hidden Lake, Glacier Nat. Pk. (USNM 102503); Lake Evangeline, Glacier Nat. Pk. (USNM 102508-9); Coal Creek, Glacier Nat. Pk. (USNM 102510-11; 30 spec.); Ole Creek, Glacier Nat. Pk. (USNM 102512; 12 spec.); Park Creek, Glacier Nat. Pk. (USNM 102514; 55 spec.); Dutch Creek Nat. Pk. (USNM 102513; 16 spec.); Muir Creek, Glacier Nat. Pk. (USNM 102504).

BRITISH COLUMBIA

Cascade Creek, 5 mi. NW of Hatzie (PMBC 634, 692); Cultus

Lake, Fraser River Valley District (ROMZ 5382-5; 5391-6; 5389-90; 5497, 4 spec.; 5399-5409; 3459; 7194-8).

Also, three additional specimens from southern British Columbia, to be reported by Dr. G. Clifford Carl.

The following key to the races of *Ascaphus truei* will correctly identify 85% of the post-metamorphic specimens seen:

Key to the Races of *Ascaphus truei*

1. Eye/SV ratio 13.6% or more; combined vomerine count 7 or less. Del Norte, Humboldt, and Siskiyou counties, California.

Ascaphus truei californicus, n. ssp.

Eye/SV ratio 13.5% or less; combined vomerine count 8 or more. Provenance non-Californian 2

2. Eye/SV ratio 11.85% or less; HW/SV ratio 35.2% or less. Oregon and Washington, in the Cascade-Sierra and Pacific Border Provinces.

Ascaphus truei truei Stejneger

Eye/SV ratio 12.31-13.50%; HW/SV ratio 35.6-38.6%. Northern Rocky Mountains Province in Idaho, western Montana, adjacent British Columbia, and probably extreme Washington and Oregon.

Ascaphus truei montanus, n. ssp.

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PROCEEDINGS
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A NEW LOACH OF THE GENUS
ACANTHOPHTHALMUS FROM SIAM

BY ROBERT R. HARRY
Stanford University

In his treatise of the freshwater fishes of Siam the late Dr. Hugh M. Smith (1945:300) described and figured certain specimens as *Acanthopthalmus kuhlii* Cuvier & Valenciennes. These did not agree with this species, having a deeper body and broader and fewer bands. Fraser-Brunner (1947:272) is of the opinion that these specimens represent a new Siam subspecies and places them as intermediate between *A. kuhlii kuhlii* Cuvier & Valenciennes and *A. kuhlii sumatranus* Fraser-Brunner. He further conjectured that these island forms evolved from it in two directions.

Through the courtesy of Dr. Leonard P. Schultz of the United States National Museum four of the specimens in question (including the one figured by Smith) were forwarded to us. Our examination of this material appears to show them to be distinct from previously described forms, but most closely related to *A. kuhlii*. Dr. Schultz has kindly allowed the Stanford Museum to retain one specimen.

Dr. George S. Myers brought my attention to this problem, and it was originally intended that he was to have been co-author. I wish to thank Dr. Myers, however, for reading the manuscript and for constructive criticism throughout.

Acanthopthalmus myersi new species

HOLOTYPE: U.S.N.M. number 103300; 67.2 mm in standard length; collected at Nong Khor, S. E. Siam on February 11, 1927, by Hugh M. Smith. This specimen was figured by Smith (1945:300, fig. 62) as *Acanthopthalmus kuhlii*.

PARATYPES: U.S.N.M. number 103300; 2 specimens 40.3 and 46.0 mm. in standard length; same locality as above. Stanford University number 14888; 1 specimen 48.0 mm. in standard length; same locality as above.

DIAGNOSIS: A deep bodied, compressed *Acanthopthalmus* with a basic color pattern agreeing with figure 1, c of Fraser-Brunner (1947:171). Head 6-7.5 in standard length. Pelvic fin origin slightly

behind middle of total length. Dorsal fin rays II,8. Origin of anal fin distinctly behind a vertical from posterior end of dorsal base. Nine to 11 black transverse bands on body.

DESCRIPTION: In the following description the measurements and counts are taken from all four types with those for the holotype given first, followed by the range of variation for the three paratypes in parentheses. The measurements were made with a pair of fine-point dividers to the nearest tenth of a millimeter and divided into standard or head length as indicated. The fleshy skin at the bases of the fins was dissected away to make the counts. The last two closely applied rays in the dorsal and anal fins are counted as one.

Body elongate, moderately compressed, that of the holotype strongly compressed and deep. Body depth 6.9 (7.0-7.2) in standard length. Caudal peduncle long, slightly tapering in depth, its least depth 2.9 (2.1-2.4) in its length from end of dorsal base. Anus immediately in advance of anal fin.

Head moderately deep and compressed, 7.5 (6.0-7.0) in standard length. Snout steep, rounded before eye, 2.4 (1.9-2.7) in head length. Nostrils on each side close together, situated immediately before the eye. Anterior nostril with a raised tube, its underside pigmented, the opening inclined obliquely forward. Posterior nostril without a raised rim, half-moon shaped or oval. Interorbital strongly convex, its width 5.3 (5.0-6.1) in head. The two suborbital spines in a slit below eye, their bases inserted slightly before eye. Anterior spine small, its tip extending beyond posterior border of pupil. The larger prong terminates beyond posterior rim of eye. Mouth small, inferior, the maxillary not reaching to a vertical from anterior border of eye. Three pairs of barbels present, well developed: rostral pair close together near the apex of the snout; maxillary pair and mandibular pair near the angle of the gape. In holotype mandibular barbels slightly the longest; in paratypes barbel pairs approximately of equal length. Lips of mandible expanded into two well developed fleshy lobes on each side of symphysis. Eye small, before middle of head length, its diameter 9.0 (6.7-8.8) in head. Gill opening restricted, its width 3.6 (3.4-4.1) in head, extending to opposite uppermost rays of pectoral fin.

Scales excessively small, present on body and nape. Absent on head. Lateral line absent.

Dorsal fin II,8 (II,8) on posterior third of body. Distance from tip of snout to dorsal origin 1.4 (1.3-1.5) in standard length. Distance from dorsal origin to pelvic origin 6.7 (6.6-8.1) in standard length. Distance from posterior end of dorsal base to a vertical from anal fin origin 4.5 (10.0-13.4) in head. Length of dorsal base 2.3 (1.1-2.8) in head. Anal fin II,7 (II,6 or 7). Length of anal base 2.7 (2.3-2.4) in head. Length of anal fin measured from origin to tip of longest ray 1.3 (1.4-1.5) in head. Distance from anal fin origin to tip of snout 1.3 (1.2-1.3) in standard length. Distance from pelvic fin origin to anal base 4.7 (4.8-5.0) in standard length. Pectoral fin 1,9 (1,9), its longest ray 1.3 (1.6-1.8) in head. Pelvic fin 1,5 (1,5), its length 2.0 (2.4-2.9) in head. Distance from tip of snout to pelvic fin organ 2.0 (1.6-1.7) in standard length. Caudal fin slightly lunate, 14 principal rays, its length 8.0 (6.2-6.8) in standard length.

MEASUREMENTS IN PERCENT OF STANDARD LENGTH:

Length of head 13.3 (14.4-16.6); length of snout 5.7 (5.4-7.0); diameter of orbit 1.5 (1.7-2.5); width of interorbital 2.5 (2.7-3.0); width of gill opening 3.7 (3.5-5.0); greatest depth of body 14.6 (13.2-14.4); length of caudal peduncle from end of dorsal base to mid-base of caudal fin 25.3 (21.7-23.3); least depth of caudal peduncle 8.8 (9.8-10.2); distance from snout to dorsal origin 70.8 (71.3-76.7); distance from pelvic origin to a vertical from dorsal origin 14.9 (12.4-15.2); distance from end of dorsal base to a vertical from anal fin 3.0 (1.2-1.5); length from dorsal origin to tip of longest depressed ray 10.3 (10.9-12.5); distance from snout to anal 76.6 (77.1-81.9); distance from pelvic origin to anal 21.4 (20.0-20.8); length of anal base 4.9 (6.3-7.0); length from anal origin to tip of longest depressed ray 10.1 (10.4-11.2); length of longest pectoral ray 10.0 (8.7-9.5); distance from tip of snout to pelvic fin base 50.6 (56.5-61.3); length of pelvic fin 6.9 (5.6-6.0); length of caudal fin from mid-base of fin to tip of longest rays 12.5 (14.7-16.2).

COLORATION: Color pattern same as that of *A. kuhlii* in the holotype and *A. sumatranus* in the paratypes, but significantly differs from both species in fewer body bands and by lacking the lighter coloration at the middle of each band, which is characteristic of the other two species. Broad transverse bands (in life colors black, according to Smith) alternate with narrow light bands (in life colors red, according to Smith). These bands extend well down the side to the belly. Three dark bands are present on the head, 9-11 on the body (in the holotype 11 on the left, 10 on the right side), and one large darker band on the caudal fin. Belly and throat light, yellowish in alcohol specimens.

The dark body bands in the paratypes do not extend as far down the sides as in the holotype and are more irregular in outline, approaching *A. semicinctus* in this respect. It would appear that the bands become more complete ventrally with age.

DISCUSSION OF RELATIONSHIPS: The Cobitid loaches of the genus *Acanthophthalmus* related to *A. kuhlii* have been the subject of a recent study by Fraser-Brunner (1940). His review revealed that several forms had been confused as the actually very rare *kuhlii*. He recognized four forms: *A. shelfordi* (Popta) from Borneo, *semicinctus* Fraser-Brunner from the Malay Peninsula, *kuhlii kuhlii* Cuvier & Valenciennes from Java, and *kuhlii sumatranus* from Borneo. The two subspecies are recognized from a single example from each locality. Considering the difficulty of pursuing a problem of subspeciation on the basis of so few examples, I am inclined to accept Fraser-Brunner's subspecies as full species until further investigations show that these forms intergrade. Fraser-Brunner's basic divisions in his key to differentiate *shelfordi* and *semicinctus* from *kuhlii* are apparently invalid. Specific variation in *semicinctus* alone overlaps in all the characteristics he used. In addition, the head length of 8 for *kuhlii* and *sumatranus* does not agree with his illustrations of the species, which show it as approximately 6.5 times in standard length. Neither are the pelvic fins shown in the latter two species as far behind the middle of the total length as would be expected from the key. The color pattern differences are the only characters evident that will sufficiently differentiate the several forms.

The closest relatives of *A. myersi* appear to be *khulii*, *sumatranus* and *semicinctus*. It is similar to the first two forms in the number of dorsal rays (II, 7 or 8), the number of anal rays (II, 6 or 7), in the position of the pelvic fin which is somewhat behind the middle of the standard length, in the relation of the anal origin to the dorsal base (anal fin commencing distinctly behind end of dorsal), and in basic color pattern (parallel bands of body in a single series, extending well down the side). It can be differentiated from them by greatest depth (6.9-7.2 in *myersi* versus 8-9 in *khulii* and *sumatranus*), in distance from pelvic origin to anal origin (4.7-5.0 versus 4.0-4.3 in standard length), in head length (6.0-7.5 versus 8?), by the number of vertical bands on the body exclusive of the head (9-11 versus 12-17) and by the coloration of the bands (Body bands not normally divided in the middle [divided on one band on the holotype only] and never paler in the center than at the edges, versus bands paler in the center than at the edges or are distinctly paired).

A. myersi is separated from *semicinctus* by the number of dorsal rays (II, 8 versus II, 6 or 7), and by differences of coloration (parallel bands extending down the sides, lacking a median light saddle on any of the bands versus tapering patches confined to the upper part of the body and generally a median light saddle on every band).

This species is named *Acanthophtalmus myersi* in honor of Prof. George Sprague Myers of Stanford University in appreciation of his interest and research on Indo-Malayan fishes.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

ON A COLLECTION OF SEA-STARS FROM THE
PHILIPPINE ISLANDS

BY AUSTIN H. CLARK¹

The American Museum of Natural History, New York, through Mr. John C. Armstrong, has recently submitted to me for study a collection of sea-stars made by Dr. Willard G. Van Name and Mr. G. R. Oesch in the Gulf of Dávao, southeastern Mindanao, in 1936 and 1937. I am deeply indebted to the American Museum and to Mr. Armstrong for the privilege of studying this interesting collection.

Although there are many records of sea-stars from the Philippines, most of them are without definite locality or other data. On May 18, 1908, the Bureau of Fisheries steamer *Albatross* made a number of dredge hauls in the Gulf of Dávao at six of which, in from 18 to 28 fathoms, sea-stars were found. In his memoir on the sea-stars of the Philippines published in 1919 (1) Dr. Walter K. Fisher listed from these stations *Protoreaster nodosus*, *Pentaceraster alveolatus*, *Fromia japonica*, *Nardoa squamulosa*, *Ophidiaster fuscus*, *Othilia luzonica* and *Retaster insignis*.

All these species presumably occur in shallow water along the shore, but only *Protoreaster nodosus* and *Othilia luzonica* are represented in the present collection. All but *Retaster insignis* have been taken in shore collecting at Port Galera, Mindoro.

In his memoir on the echinoderms of Torres Strait published in 1921 (2) Dr. Hubert Lyman Clark mentioned several littoral sea-stars from the Philippines, but the only definite records were: *Nardoa pauciforis*, Bantayan reef, Cebu; *Nardoa novaecaledoniae*, *Nardoa tuberculata*, and *Leiaster speciosus*, Port Galera, Mindoro; and *Bunaster lithodes*, Apo reef, Mindoro.

Drs. José S. Domantay and Hilario A. Roxas in 1938 (3) published a list of littoral sea-stars from Port Galera bay in northern Mindoro. This list includes 50 species, but of these

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12 are synonyms or varieties. Their *Linckia multifora* from the figures they give appears to be *L. laevigata*. A new species, *Hippasteria philippinensis*, is undoubtedly the young of *Culcita novaeguineae*. They did not include *Leiaster speciosus* from Port Galera listed by Dr. H. L. Clark, or *Bunaster lithodes* from Apo reef.

Although the list of Domantay and Roxas includes 38 species, and the present list only 17, Dr. Van Name and Mr. Oesch secured no less than seven species not found by them. These seven species are: *Goniodiscus forficulatus*, *Ophidiaster lioderma*, *Ophidiaster pustulatus*, *Asterina coronata coronata*, *Asterina cephea*, *Valvaster striatus*, and *Mithrodia clacigera*.

ANNOTATED LIST OF THE SPECIES ARCHASTERIDAE

Archaster typicus Müller and Troschel

Localities.—Padada Beach, Gulf of Dávao, Mindanao; G. R. Oesch, April 5, 12, May 2, 3, 1936 (5+ specimens).

Mouth of the Padada River; G. R. Oesch, June 23, 24, 1936 (2 specimens).

Notes.—The size ranges from $R = 48$ mm. to $R = 22$ mm. In the largest specimen one arm forks half way to the tip, the two branches diverging in almost a straight line.

GONIASTERIDAE *Goniodiscaster forficulatus* (Perrier)

Locality.—Padada Beach; G. R. Oesch, June 20, 1936 (1 specimen).

Note.—This specimen is very small, $R = 11$ mm., $r = 4$ mm.

OREASTERIDAE *Protoreaster nodosus* (Linné)

Localities.—About 1.5 miles from the Paloda River, Gulf of Dávao, near Mangrove Island; Dr. W. G. Van Name (2 specimens).

Stony beach just south of Santa Cruz, Gulf of Dávao; Dr. W. G. Van Name, November 7, 1937 (2 specimens).

Notes.—The specimens from near Mangrove Island in life were light yellow with the tubercles and tips of the rays brown. They measured $R = 68$ mm. and $R = 60$ mm. Dr. Van Name said that some individuals are redder, and some brick or rich red.

One of the specimens from near Santa Cruz with $R = 90$ mm. was yellowish, becoming warm brown on the tubercles and toward the tips of the arms; the oral side was wholly yellowish. The other, with $R = 80$ mm., was mostly yellowish gray above, becoming warm brown on the spines and distal part of the arms, and yellowish below.

LINCKIIDAE *Fromia elegans* H. L. Clark

Locality.—Puerto Galera, northern end of Mindoro; Dr. W. G. Van Name, October 1937 (3 specimens).

Notes.—The specimens measured $R = 48$ mm., $r = 10$ mm.; $R = 46$ mm., $r = 10$ mm., and $R = 45$ mm., $r = 9$ mm. The color in life was bright red.

This species was described by Dr. H. L. Clark from specimens from Mer, Murray Islands, Torres Strait. He gave the size of the type as $R = 36-38$ mm., $r = 8.5$ mm. (in life nearly 10 mm.).

In 1938 Messrs. Domantay and Roxas recorded it from "Port Galera Bay and other places" and noted that it was the most common species of *Fromia* found at the station. They gave the color as "body brick red with abactinal plates light brick red. Ambulacral, adambulacral, and furrow spines together with paxillae on oral side uniformly brick red."

In 1946 Dr. Clark wrote that "This is an endemic [Australian] species so far as is yet known, and since it has been found at three widely separated points, it is probably pretty well distributed on the tropical coasts of Australia. It has not been found elsewhere, for although Domantay and Roxas (1938) record it from the Philippines, it is evident both from the figures given and from their description of the color in life that their specimens are different from the Australian species."

The specimens at hand are certainly *F. elegans*. The figures given by Domantay and Roxas are rather vague, but there is nothing in them nor in their description to indicate that their determination was not correct.

Nardoa tuberculata Gray

Localities.—Padada Beach; G. R. Oesch, March 8, May 9, 10, June 20, 21, 1936 (22 specimens).

Santa Cruz, Gulf of Dávao; Dr. W. G. Van Name, November 21, 1937 (5 specimens).

Notes.—The specimens range in size from $R = 70$ mm. to $R = 20$ mm. One with $R = 37$ mm. is six-rayed.

Linckia laevigata (Linné)

Localities.—Padada Beach; G. R. Oesch, March 8, May 9, 10, June 20, 21, 25, 26, 28, July 6-19, 1936 (20 specimens).

Reef of Digos, Gulf of Dávao; Dr. W. G. Van Name, November 14, 1937 (4 specimens).

North of Paloda River, Gulf of Dávao; Dr. W. G. Van Name, November 6, 1937 (1 specimen).

About 1.5 miles from the Paloda River, Gulf of Dávao, near Mangrove Island; Dr. W. G. Van Name (1 specimen).

Puerto Galera, northern end of Mindoro; Dr. W. G. Van Name, October 1937 (2 specimens).

Notes.—Large specimens, $R = 90$ to 165 mm., are described as "bright blue" or "blue all over." Two specimens with $R = 75$ mm. and 62 mm. were purplish in life. One with $R = 16-45$ mm. was dull red. One specimen from Padada Beach has three rays 33-27 mm. long and three small buds.

Domantay and Roxas' figures of *Linckia multifora* from Port (or Puerto) Galera appear to me to represent *L. laevigata*. They say that their two specimens of *L. multifora* had only a single madroporite, which would suggest that they were really *L. laevigata*.

Linckia multifora (Lamarek)

Locality.—Padada Beach; G. R. Oesch, May 9, 10, 1936 (2 specimens).

Notes.—In one of the specimens the rays are 27, 17, 17, 17, 15 mm. long; in the other they are 47, 37, 37, 32, 27 mm. long.

Ophidiaster lioderma H. L. Clark

Locality.—Padada Beach; G. R. Oesch, May 9, 10, 1936 (2 specimens).

Note.—In one of the specimens R = 55 mm.

Ophidiaster granifer Lütken

Localities.—Padada Beach; G. R. Oesch, March 8, June 5, 6, 20, 21, 23, 24, June 28 to July 8, July 6-19, 1936 (20 specimens).

Mouth of the Padada River; G. R. Oesch, June 23, 24, 1936 (94 specimens).

About 1.5 miles from the Paloda River, Gulf of Dávao, near Mangrove Island; Dr. W. G. Van Name (1 specimen).

Reef of Digor, Gulf of Dávao; Dr. W. G. Van Name, November 14, 1937 (1 specimen).

Santa Cruz, Gulf of Dávao; Dr. W. G. Van Name, November 21, 1937 (1 specimen).

Notes.—The specimens range in size from R = 30 mm. to R = 12 mm. When dried this species usually has a characteristic broadly blotched light and dark grayish color.

Ophidiaster pustulatus (von Martens)

Locality.—Padada Beach; G. R. Oesch, July 6-19, 1936 (1 specimen).

Notes.—R = 37 mm. Pedicellariae with straight alveolae are rather numerous, occurring sometimes on every supermarginal beyond the first six or eight, and frequently elsewhere.

ASTERINIDAE

Asterina coronata coronata von Martens

Localities.—Padada Beach; G. R. Oesch, March 8, May 9, 10, June 20, 21, 23, June 28 to July 8, 1936 (15 specimens).

Mouth of the Padada River, Gulf of Dávao; G. R. Oesch, June 23, 24, 1936 (1 specimen).

Reef of Digor, Gulf of Dávao; Dr. W. G. Van Name, November 14, 1937 (1 specimen).

About 1.5 miles from the Paloda River, Gulf of Dávao; Dr. W. G. Van Name (6 specimens).

One kilometer north of Santa Cruz, Dávao Gulf; Dr. W. G. Van Name, November 20, 1937 (1 specimen).

Asterina cephea Müller and Troschel

Localities.—Padada Beach; G. R. Oesch, March 8, June 20, 21, 25, 26, 28, June 28 to July 8, July 6-19, 1936 (12 specimens).

One kilometer north of Santa Cruz, Dávao Gulf; Dr. W. G. Van Name, November 20, 1937 (1 specimen).

Note.—Dr. Van Name's specimen from north of Santa Cruz is six-rayed.

Patiriella exigua (Lamarck)

Localities.—Padada Beach; G. R. Oesch, March 8, May 2, 3, 9, 10, June 20, 21, 28, June 28 to July 8, July 6-19, 1936 (92 specimens).

About 1.5 miles from the Paloda River, Gulf of Dávao, near Mangrove Island; Dr. W. G. Van Name (6 specimens).

Note.—One of the specimens from Padada Beach, March 8, 1936, is six-rayed.

ECHINASTERIDAE

Othilia luzonica Gray

Locality.—Padada Beach; G. R. Oesch, June 28 to July 8, 1936 (1 specimen).

Note.—The single specimen is six-rayed.

ACANTHASTERIDAE

Acanthaster planci (Linné)

Locality.—One kilometer north of Santa Cruz, Gulf of Dávao; Dr. W. G. Van Name, November 20, 1937 (1 specimen).

Notes.—This specimen has 13 rays 90 mm. long. In life the upper surface was gray with small purple dots, the spines brown.

VALVASTERIDAE

Valvaster striatus Perrier

Locality.—Puerto Galera, northern end of Mindanao; Dr. W. G. Van Name, October 24, 1937 (1 specimen).

Notes.—R = 55 mm., r = 17 mm. The color in life was yellowish with brown markings.

MITHRODIIDAE

Mithrodia clavigera (Lamarck)

Localities.—Padada Beach; G. R. Oesch, July 6-19, 1936 (fragments). Santa Cruz, Gulf of Dávao; Dr. W. G. Van Name, November 21, 1937 (1 specimen).

Note.—Dr. Van Name's specimen from Santa Cruz is small, with R = 95 mm.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THREE NEW SPECIES OF DIPLOPODA
FROM VIRGINIA

BY RICHARD L. HOFFMAN

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Collections of diplopods made in Virginia during the summers of 1947 and 1948 include several new species, three of which are herein described.

PARAIULIDAE

Saiulus montanus, new species

(Figures 5 & 6)

Diagnosis.—A small member of the genus, characterized as follows: posterior gonopods of male large, as high as anterior, coxal portion of anterior much reduced; outer valves of female gonopods fused with operculum along lateral edge.

Description of male holotype.—Width approximately 1.5 mm., length undetermined because of breakage; body with 51 segments, ventrolateral portion of each metazonite finely striate; anal valves inflated, large and somewhat protruding; spine of terminal segment large, strongly decurved, sharply pointed.

Color very dark brown or black (in alcohol) with the caudal half of each metazonite light tan, producing a sharply ringed appearance; collum and head lighter brown, front of head fading into tan at the labrum, antennae black; legs yellowish-brown.

Gonopods of the *canadensis* type, i.e., with the coxal elements of the anterior pair shorter than the femoral. Sternal plate small, its basal margin concave at the center, swept upwards toward the sides, distal margin produced into a triangular, distally rounded projection. Immediately laterad of the sternal plate are two small pyriform pieces, wide at their bases and tapering laterad, their ends bent proximal. Coxal plates broad at base, the outer basal portion set off by a conspicuous oblique groove; the inner, produced portion with a large mesial shoulder; the plate distally rounded. Femoral plates thin, upright pieces, three times as high as long, distally setose, the rear margin of each produced at about midlength into a small arm which projects caudomesiad and overlaps the posterior gonopods. Posterior pair of gonopods strongly chitinous, flattened, lamellae, as broad and high as the femora of the anterior pair, and distally crenulate. A single, clavate, structure projects distad in front of the posterior gonopods. See figure 6 for gonopods drawn in cephalic aspect.

Description of female allotype.—Width approximately 1.8 mm., length undetermined due to breakage; body with 52 segments. Color and other features much as in the male.

Female gonopods of the same type as those figured by Brolemann (1922: fig. 32) for *Saiulus immaculatus*, differing however, and distinct in the following characters: operculum relatively smaller in comparison with other parts, its caudal portion with a conspicuous, short indentation; outer valve smaller, its distal portion directed mesiad, the lateral edge fused with the operculum at about the same level as the point of fusion of the mesial edge with the inner valve.

Type specimens.—Male holotype, female allotype, and male paratype in the U. S. National Museum, No. 1847, collected on July 1, 1947.

Type locality.—Mount Rogers, Grayson County, Virginia, at an elevation of 5000 feet. The specimens were found beneath a board in a small grassy field, with the surrounding forest chiefly hemlock (*Tsuga* ssp.), maple (*Acer pennsylvanicum*), yellow poplar (*Liriodendron tulipifera*), and redbud (*Cercis canadensis*). Millipeds associated with the paraiulids were *Spirostrephon lactarium* (Say) and *Pseudopolydesmus serratus* (Say).

Distribution.—In addition to the type locality, *Saiulus montanus* has been found only at Mountain Lake, Giles County, Virginia, where several males and females (R.L.H. no. 108) were obtained at Castle Rock, west of the Biological Station, by members of the Arthropods class on July 20, 1947, and transmitted to me by Dr. Horton H. Hobbs, Jr. This locality is at about 4000 feet elevation, and in the same biotic province (Canadian) as is Mount Rogers.

Remarks.—Apparently *Saiulus* is a genus with boreal affinities, widespread in northern United States, but confined, in more southern latitudes, to high elevations. Another, rather different, species—*S. fumans* Chamberlin (1943:10)—has been described from the Great Smoky Mountains in Sevier County, Tennessee.

XYSTODESMIDAE

Nannaria shenandoa, new species

(Figures 1-4)

Diagnosis.—A small member of the genus, characterized by the distally expanded and bifid telopodite of the male gonopod, and by the falcate nature of the lateral process, unusual in being conspicuously bent mesiad across the main branch.

Description of male holotype.—Body small, length, 23.5, width, 4.2 mm.; sides nearly parallel, segments four through fourteen being of almost exactly full width, body thus tapering abruptly cephalad and gently caudad; dorsum but slightly arched, keels small and continuing slope of dorsum.

Head small, vertex with very faint groove, interantennal width, .83 mm.; length of antennae, 3.5 mm., sixth article conspicuously longer than the others which are subequal in length.

Collum large, subtrapezoidal in dorsal aspect, the caudal margin almost straight, the cephalolateral corners rounded, the cephalic margin slightly convex. Cephalolateral marginal ridges large and distinct.

Tergites of segments two through four similar, keels produced somewhat forward of rest of dorsum; marginal ridges well developed.

Tergites five through fifteen similar, keels more or less in line with rest of dorsum, marginal thickenings becoming larger; edges of keels slightly oblique, directed cephaloventrad, but to a lesser extent than in

most xystodesmids; anterior corners slightly rounded, posterior corners angular, becoming slightly produced towards the rear of the body; posterior margins of keels slightly sinuate; upper surface of tergites smooth.

Tergites of segments sixteen through nineteen becoming narrower caudad, with keels increasingly produced, those of nineteenth forming short, rounded, lobes, .45 mm. in length, width of tergite between bases of lobes, 1.12 mm.

Repugnatorial pores small, placed on the lateral margin of the keels, in the posterior third of the length.

Twentieth segment triangular in dorsal aspect, about as long as broad, tip slightly truncate. Anal valves almost flat, minutely wrinkled vertically, setiferous tubercules close to the well developed mesial ridges.

Preal anal scale broad, short, triangular, the lateral tubercules obsolete.

Bases of last pair of legs well separated, prefemora¹ separated at base by approximately .34 mm.; sternites becoming wider cephalad, legs at midbody .91 mm. apart; the sternites between the last pair of legs on each segment posterior to the 6th produced into conspicuous sharp processes.

Legs at midbody with prefemora and femora small, subequal in size, tibia somewhat longer, tarsi 1 and 2 short, as broad as long, tarsus 3 longer, conical, tarsal claw short, heavy, angularly bent. Lengths of joints of legs, from base distad, .53, .53, .87, .38, .33, .41 mm.

Pleurites finely coriaceous, prozonite with the wrinkles much smaller. Stigma very narrow, upper end drawn out.

Gonopodal aperture broadly oval, the margin uninterrupted in front. Gonopods at rest with the basal portion caudad (facing cephalad when the organs are protruded), the tips of the telopodite blades crossing and directed caudolaterad. Coxa subcylindrical, the caudal portion much elevated, mesial side with a small but prominent rounded knob. Mesial process low, sparingly setiferous, rather broad in cephalic aspect; lateral process produced into a long, slender, falcate spine, curving mesiad across the femoral portion of the telopodite and distally recurved laterad. Telopodite slender, flattened at the base, becoming subcylindrical distad and curved mesiad and cephalad, the extremity becoming flattened and angularly bent proximad with a small "heel" at the outside edge of the bend. The distal half of this flattened portion is bifid.

Sternites between the fourth pair of legs with a pair of upright, subconical processes, very conspicuous and as high as the cylindrical seminal processes of the second pair of legs which in this form are longer than usual for xystodesmids. Other legs without special processes.

Color in life as follows: tergites blackish with outer portions of keels (both cephalo- and caudolateral corners) pink, head brown with margin of labrum and an interantennal band light tan; underparts pale gray, sternites tan. Antennae gray with distal portion of each article white.

Description of female allotype.—Agreeing in general with the male, differing as follows: length 25, width, 4.7 mm.; dorsum more arched; marginal thickenings and angularity of caudolateral corners of keels

¹This term is arbitrarily used in preference to either coxa or trochanter for the joint between the femur and sternite, pending an investigation to determine which of the prefemoral joints is lost in xystodesmids.

more pronounced. Femoral spines larger, anterior sternites without paired processes.

Gonopodal aperture large, including second pair of legs and large female organs. Lateral edge of aperture margined with a thin upright flange, also caudal edge with an upright, shallowly indented flange. Gonopods composed of a pair of thick, reniform valves, their surface granular and setose in places, attached by their basal ends to a triangular receptacle, into which they are retractable. When protruded, the free ends are directed caudad and the valves are parallel with the median axis of the body. The left gonopod is illustrated, in lateral or outer view.

Color apparently not fully developed, being chiefly uniform tan with a dark median line on the tergites. Underparts white.

Type specimens.—Male holotype, female allotype, and male paratype in the U. S. National Museum, No. 1848. Four paratypes in my personal collection, RLH no. 160, collected on July 3, 1948.

Type locality.—Shenandoah Mountain, about 15 miles west of Harrisonburg, Rockingham County, Virginia, elevation about 3500 feet. Specimens were found in a rather dry stand of *Quercus* (*Q. alba* and related species) with undergrowth mainly scrub oak and laurel (*Kalmia latifolia*). The humus layer was about two inches deep, overlying loose sandstone fragments. The only invertebrates noted in association were numerous ants and a few small beetles.

Remarks.—The relationships of this species are clearly with the recently described *Nannaria morrisoni* Hoffman (1948:348), a form known from several localities in the Blue Ridge in Virginia. These two species, with another yet undescribed from Mountain Lake, Virginia, form a distinct section within the genus, differing from *N. media* and related forms in which the telopodite blade is bent laterad and distally unmodified. It is possible that the disjunct forms should be properly included in a separate genus, but it is felt that such a step should be preceded by a study of all the known forms of *Nannaria*, towards which I am now accumulating material.

Zinaria rubrilata, new species

Diagnosis.—A small member of the genus, related to *butleri*, characterized by the size, color of the metazonites, and the relatively short, straight lateral spine of the male gonopod.

Description of male holotype.—Body small, length, 32.5, width, 5.6 mm.; sides subparallel, segments five through fifteen of approximately full width; dorsum compressed, less arched than in *butleri*; keels relatively wide, continuing slope of dorsum.

Vertex of head with a very faint shallow groove. Interantennal width, 1.0 mm.; antennae relatively long, slender, 5.5 mm. in length. Labral pores in upper series, 20, in lower 20; labrum with a very deep median notch, teeth subequal in size.

Collum large, subellipsoidal in dorsal aspect, tapering evenly towards the ends, cephalolateral marginal ridge small but sharply defined.

Tergites of segments two through four similar, keels conspicuously bent forward, their posterior mesial margins well forward of caudal margins of tergite at midline; marginal ridges larger than on collum and

somewhat more tumid, upper surface of keels becoming coriaceous and caudolateral corner with a suggestion of a denticle.

Tergites five through fifteen similar, keels more or less in line with rest of dorsum, marginal thickenings becoming larger; edges of keels slightly oblique, directed cephaloventrad; anterior corners broadly rounded, posterior corners angular and slightly produced caudad, this becoming more pronounced towards the rear of the body; posterior margins of keels slightly sinuate; upper surface of keels distinctly coriaceous, of rest of dorsum finely wrinkled, prozonite smooth.

Tergites of segments sixteen through nineteen becoming narrower caudad, with keels increasingly produced, those of nineteen forming short, bluntly triangular lobes, .50 mm. in length; width of tergite between bases of lobes, 1.37 mm.

Twentieth segment triangular in dorsal aspect, somewhat elongate in appearance; two pairs of tiny lateral setiferous tubercules; tip slightly truncated. Anal valves slightly inflated, very finely wrinkled vertically, setiferous tubercules almost in contact with the well developed mesial ridges.

Preanal scale large, broadly triangular, lateral tubercules large and well set off from the margin.

Bases of last pair of legs almost in contact, prefemora separated at bases by approximately .37 mm.; sternites becoming wider cephalad, legs at midbody 1.0 mm. apart; the sternites between last pair of legs on each segment enlarged and slightly produced caudad, but not forming actual lobes or spines.

Legs at midbody with prefemora subtrapezoidal, flattened; femora short, cylindrical, femoral spine short, conical; tibiae elongated, cylindrical, enlarged distally; tarsus 1 much thicker than distal two, tarsus 3 the longest, bearing a slender curved claw; all joints with numerous slender bristles.

Pleurites finely but distinctly coriaceous. Stigmata cephalodorsad of legs, elongate, the ends pointed.

Gonopodal aperture broadly oval, margin uninterrupted at midline. Gonopods large, generally similar to those illustrated by Chamberlin (1939: fig. 5) for *butleri* (under the name *Z. urbana*), differing somewhat in having the long spine from the lateral process straight instead of bent mesiad across the face of the telopodite.

Sternites between third pair of legs with a pair of thin, upright, keel-like processes; those between fourth pair with two small, conical processes, their ends slightly crenulate. Coxae of second pair of legs with the usual seminal lobes; these short and slightly enlarged distally.

Color in life as follows: majority of tergite orange-red or bright chestnut brown, keels, legs, and pleurites yellowish; middle portion of collum and exposed parts of prozonites black; top of head brownish-black, fading into white along margin of labrum and in antennal sockets; antennae whitish-yellow, becoming slightly darker distally.

Description of female allotype.—Agreeing in general with the male, differing in the following respects: slightly smaller, length, 30, width, 6.1 mm.; dorsum more arched; body widest near posterior end; femoral spines larger; anterior legs without processes.

Gonopodal aperture wide and short, its edges without special rims or flanges as noted above under *Nannaria*. Exposed portion of gonopod

appearing tripartite (resembling three appressed fingertips); outer valve of gonopod with distal (free) end conspicuously larger than that of inner.

Color much as in the male, not as intense, black or prozonites slightly encroaching on metazonites.

Type specimens.—Male holotype, female allotype, and a paratype of each sex in the U. S. National Museum, No. 1849, and nine male and two female paratypes in my collection, RLH no. 161, to be distributed to other museums. All specimens taken together, July 13, 1948.

Type locality.—State Highway 3, one mile north of Kilmarnock, Lancaster County, Virginia. Specimens taken at the mouth of a culvert draining a large pond on the northeast side of the highway. Surrounding area chiefly wooded, a pine-oak association.

Remarks.—The nearest relative seems to be *Z. butleri* (McNeill), which is considerably different in lacking red on the dorsum (at least in all of the Virginia material referred to *butleri*) and in having the lateral spine of the male gonopod larger and curved mesiad. Also, all of the Virginia *butleri* (from five localities) are somewhat larger than *rubrilata*. Of course, there is the possibility that the Virginia population may be different form that of Indiana, but this has no bearing on the identity of *rubrilata*. In addition to the type locality, it has been found also near Irvington, in Lancaster County (a single female, RLH no. 162, August 17, 1948).

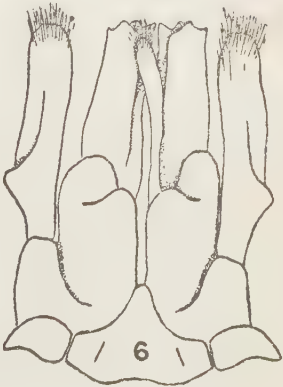
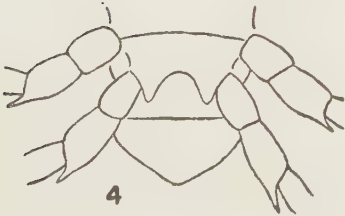
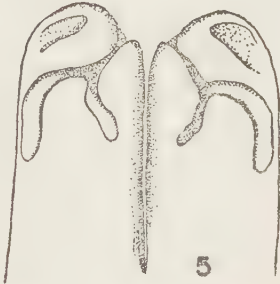
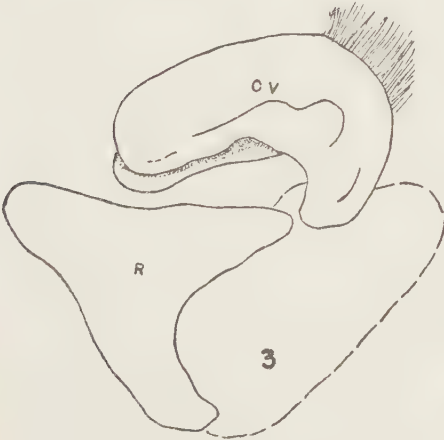
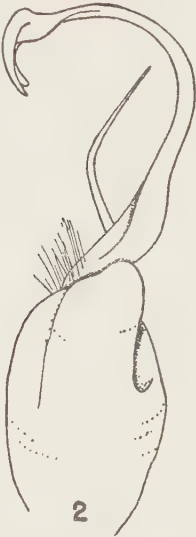
The red pigment of *rubrilata* seems to be more extensive than in any other known xystodesmid. At a distance it is difficult to observe the thin black edge of the prozonite and the impression is that of a uniformly red milliped.

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EXPLANATION OF PLATE

- Figure 1. *Nannaria shenandoa*, n. sp., left gonopod of male, cephalic view. L—lateral process, M—mesial process, S—solenite.
- Figure 2. *Nannaria shenandoa*, left gonopod of male, mesial aspect.
- Figure 3. *Nannaria shenandoa*, left gonopod of female, lateral view. R—receptacle, OV—outer valve.
- Figure 4. *Nannaria shenandoa*, preanal scale and bases of last two pairs of legs, showing production of sternite.
- Figure 5. *Saiulus montanus*, n. sp., gonopods of female, caudad view.
- Figure 6. *Saiulus montanus*, gonopods of male, cephalic view.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

AMERICAN CAUDATA. VI. THE RACES OF
EURYCEA BISLINEATA

BY M. B. MITTLEMAN

The collection of considerable numbers of two-lined salamanders in Indiana, and the necessity of establishing their subspecific identity in connection with a forthcoming report on the herpetology of this state, has prompted me to compare these specimens with extensive series of two-lined salamanders from other parts of the range of this species. Reynolds and Black (1936: 293) pointed out that specimens from Parke County, Indiana, are more similar to *Eurycea bislineata cirrigera* and *E. b. wilderae* in having 14 costal grooves, than to *E. b. bislineata* which is generally characterized as having 15 grooves. The majority of my material agrees with Reynolds and Black's description, and since standard references (Stejneger and Barbour, 1943; Bishop, 1943; Dunn, 1926) are in accord in considering Indiana two-lined salamanders referable to *bislineata*, the situation seems amenable only to a thorough-going study of the entire status of riation in *Eurycea bislineata*. Racial identification of the Indiana two-lined salamanders inevitably depends on the definitions of *bislineata* and its subspecies.

Unfortunately, as pointed out by Dunn (1926: 297), Green designated neither type specimens nor a type locality for his *Salamandra bislineata*. Stejneger and Barbour (1943: 30) suggest Princeton, N. J., as the type locality, and for practical purposes, I have considered specimens from the northern half of New Jersey as "typical" of *bislineata*. Such specimens are fairly homogeneous in having 15 or 16 costal grooves (counting inguinal and axillary branches) with about equal frequency, and in having a combined vomerine tooth count (the sum of both vomerine series) varying from 8 to 18. The color and pattern vary somewhat, but the dark brown dorso-lateral stripes usually extend for about half the length of the tail (occasionally less, rarely more); the sides of the body are sometimes immaculate, but are more often stippled with

gray or brownish, and occasionally there is a series of light spots running parallel to—and immediately below—the dorso-lateral dark stripe. There is often a small swelling, or tubercle, at the base of the naso-labial groove on the upper lip, in sexually active males, and occasionally also submental and caudal hedonic swellings.

Salamanders agreeing with this definition are found from eastern Quebec to southern Virginia, and west through the Appalachian uplift almost to the Ohio River in West Virginia. Out of 210 sexually mature specimens of both sexes from this region, 110 (= 53%) have 15 costal grooves, while the remaining 100 specimens have 16 grooves; there is no association between the costal groove count and age, sex, or geographic origin. The combined vomerine counts in this series vary from 8 to 21, average 12.2 ± 3.07 , and as in the case of the costal grooves, are not associated with age, sex, or provenance. A maximum total length of 109 mm. is found in this series (♀, Harrison, Westchester County, New York, personal collection M. B. Mittleman). The ratio of tail length to total length in metamorphosed specimens is from 46.7% (in a specimen with a total length of 47 mm.), to 59.5% (in a specimen with a total length of 96 mm.)¹.

Although relatively widely distributed and comparatively stable morphologically, the two-lined salamander undergoes several changes in the southern portion of its range, and evolves ultimately into two distinct forms, *cirrigera* and *wilderiae*. In the Atlantic and Gulf Coastal Plain, and the Piedmont, the two-lined salamander population is characterized by a costal groove count of 13 or 14, a combined vomerine count of 10-24 (average 15.8 ± 2.54), a more intense pigmentation with the dorsolateral stripe usually extending to the distal fourth (or even tip) of the tail, a well-developed lateral series of white (or at least light) spots, and prominent cirri in sexually mature males. These are the characteristics of the race *cirrigera* which extends from southern Virginia through the Coastal Plain to northern Florida and extreme eastern

¹My findings concerning the ontogenetic variation in proportionate tail length in *bislineata* are almost identical with those of Oliver and Bailey (1939: 200), and I agree with them in considering *E. bislineata major* Trapido and Clausen (1938: 119) to be synonymous with *E. b. bislineata*. A count of 17 costal grooves occasionally occurs in *major* (fide Trapido and Clausen, l.c.); this results from the anomalous branching of either the first or last costal groove, and is not normal. The type of *major* (USNM 104239 ♂, Val Jalbert, Ouiahouan River, Lake St. John Co., P. Q.) has 16 costal grooves, a tail/total length ratio of 56.5%, and a combined vomerine count of 14. Two paratypes (USNM 107208-9) from Bonaventure Co., P. Q., are similar in all respects, and like the type, are indistinguishable from many *bislineata*.

Louisiana, and inland through the Piedmont generally to the border of the Blue Ridge Province, in the Carolinas and Georgia.

The montane two-lined salamander of the Blue Ridge Province, *wilderae*, is similar to *cirrigera* in normally having 13 or 14 costal grooves (rarely, an anomalous branch of the first or last groove results in a count of 15), and prominent cirri in sexually mature males. It differs from *cirrigera* in having fewer vomerine teeth, the combined vomerine counts ranging from 4 to 17, average 11.4 ± 3.33 ; *wilderae* is also distinguished in that the heavy black (rather than brown) dorsolateral stripes stand out sharply (not tending to fuse with the pigments of the sides of the body and tail), and rarely extend beyond the middle of the tail. The range of *wilderae* is from White Top Mountain, Virginia, south through the Blue Ridge Province to Rabun and Gilmer counties, Georgia, and west to Sevier County, Tennessee.

Two-lined salamanders from Brunswick and Mecklenburg counties, Virginia (RLH² 955, 966-8), are characteristic *cirrigera*; however, specimens from Buckingham, Charlotte, and Prince Edward counties, Virginia (RLH 952-4), have the teeth of *bislineata* (combined vomerines 7, 12, 12), 14 costal grooves as in *cirrigera*, and an intermediate color and pattern. I regard them as intergrades; Dunn (1926: 303) has recorded intergrades of *cirrigera* $\times$ *bislineata* from Midway and Gloucester, Virginia.

Specimens from the extreme southern Piedmont in Georgia are difficult to assign racially. Two-lined salamanders from Rabun and Gilmer counties are referable to *wilderae*, as noted by Dunn (1926: 313; also WTN 7022-3, betw. Tiger and Wylie, Rabun Co.), although they are somewhat aberrant in having higher combined vomerine counts (12, 20) than is usual in this race. Specimens from Tray Mountain, Habersham County (USNM 115622-5) are definitely aberrant; they display the vomerine counts of *cirrigera* in three out of four specimens (12, 16, 18, 18), and have a more intense pigmentation than is normal for *wilderae*. Specimens from Duluth, Gwinnette County (USNM 91809-11) are similar, and have a pattern intermediate between *wilderae* and *cirrigera*; two of the three specimens have combined vomerine counts of 12, and one has

²Abbreviations used for collections: RLH = private collection of Richard L. Hoffman; WTN = private collection of Wilfred T. Neill; CAS = Chicago Academy of Sciences; USNM = United States National Museum; OUZ = Department of Zoology, Ohio University.

a count of 19. On the other hand, specimens taken barely forty miles to the east, in Clarke County (WTN 7543-6, 7565, 7583), have patterns which are very similar to those of Coastal Plain *cirrigera*; two of the six specimens have the characteristically high vomerine count of *cirrigera* (17, 20), while the other four have low to moderate counts (5, 8, 10, 14). The single male in this series has no cirri, although it is large (snout-vent 45 mm.) and has a fairly prominent caudal hedonic swelling. Specimens from Augusta (which is on the Fall Line) display all of the usual characteristics of *cirrigera*, and I conclude that this city and its surrounding area marks the northernmost limit of "typical" *cirrigera* in Georgia.

In addition to the differentiation which the two-lined salamander undergoes in the southern part of its range, still other changes occur in the populations lying to the west of the Alleghanian uplift, for these transmontane salamanders differ in several respects from *bislineata* and its races *wilderae* and *cirrigera*. In these specimens the costal groove count is normally 14 (81% of specimens), less often 15 (18.2% of specimens) or 16 (0.8% of specimens), thereby distinguishing them from *bislineata*. The combined vomerine counts range from 8 to 27, average 15 ± 3.73 , which likewise serve to differentiate these specimens from *bislineata* and *wilderae* (although not from *cirrigera*). The color and pattern approximate *bislineata*, although the common presence of fairly well developed light spots on the sides is strongly reminiscent of *cirrigera* (as is also the extension of the dorsolateral stripe to the tip, or the distal fourth of the tail, in many specimens). The lack of cirri in sexually mature males suggests *bislineata*, rather than *wilderae* or *cirrigera*, although occasional specimens have pronounced, even slightly elongate, swellings at the base of the naso-labial grooves. In sum, this population is most similar to *bislineata* in color and pattern and lack of extreme sexual dimorphism; it is closest to *cirrigera* in dentition and costal groove count. The transmontane population and *cirrigera* differ considerably in limb length, for the latter is a long-legged form, while the former has rather short legs. In transformed *cirrigera* of 35+ mm. snout-vent length, the appressed limbs sometimes just meet, but are more often separated by one or two costal spaces, the usual condition being about one and a half spaces. Transmontane specimens of comparable snout-vent lengths almost invariably have a great-

er number of costal spaces between the appressed toes; in this population two to four and a half spaces are found between the appressed limbs, usually about three.

It is obvious that the transmontane specimens are not identifiable with any of the earlier-described races of the two-lined salamander, and since they are nameless, I propose to call them

***Eurycea bislineata rivicola*, n. ssp.**

HOLOTYPE.—An adult male in my personal collection (to be deposited in the U. S. National Museum), taken in Echo Canyon, McCormick's Creek State Park, Owen County, Indiana, by Mary E. and M. B. Mittleman, August, 1942.

ALLOTYPE.—An adult female in my personal collection, same data as the holotype, to be deposited in the U. S. National Museum.

PARATYPES.—(I have examined several hundred specimens, and still more are extant from a great many localities; rather than enumerate all of these, I have selected as paratypes only a sufficient number of specimens to illustrate the geographic and morphologic range of this race), **WEST VIRGINIA**—*Wood County*: 5 mi. S. of Parkersburg (OUZ 924); *Mingo County*: Varney (OUZ 933). **OHIO**—*Athens County*: Canaan Twp., Sec. 11 (OUZ 28-9); *Carroll County*: no specific locality (OUZ 906); *Hamilton County*: Cincinnati (USNM 8832); *Hocking County*: Salt Creek, Benton Twp. (OUZ 1028, 13 spec.); *Monroe County*: Adams Twp., Sec. 6-36 (OUZ 946, 2 spec.); *Preble County*: 5 mi. SE of Camden (USNM 76825-6); *Washington County*: Marietta (USNM 118302-6; OUZ 945, 6 spec.). **KENTUCKY**—*Carter County*: Carter Caves (OUZ 1058, 6 spec.), Cascade Cave (OUZ 1029). **INDIANA**—*Brown County*: Brown County State Park (10 spec., MBM coll.), Pike's Peak (5 spec., MBM coll.); *Jennings County*: Muscatatuck State Park (4 spec., MBM coll.); *Marion County*: Indianapolis (USNM 17465-8; 10 spec., MBM coll.); *Monroe County*: Morgan-Monroe State Forest (2 spec., MBM coll.); *Owen County*: McCormick's Creek State Park (8 spec., MBM coll.); *Parke County*: Turkey Run State Park (CAS 1436-64); *Tippecanoe County*: Lafayette (USNM 17972-4). **ILLINOIS**—*LaSalle County*: Starved Rock (CAS 1573). **TENNESSEE**—*Cheatham County*: 2 mi. S. of Shacklett (USNM 85686); *Cumberland County*: 3 mi. E. of Pleasant Hill (USNM 87615); *Davidson County*: 5 mi. NW of Belleview (USNM 85689); *Grainger County*: Bean Station (USNM 88754); *DeKalb County*: Dowelltown (USNM 88755).

DIAGNOSIS.—A race of *Eurycea bislineata* usually having 14 costal grooves (81% of specimens), less often 15 or 16 grooves (19% of specimens); costal spaces between appressed toes two to four and a half, usually three; combined vomerine count 8-27, average 15 ± 3.73 ; no cirri in sexually active males; dorsolateral stripe extending well beyond the middle of the tail in most specimens, often reaching the tip.

DISTRIBUTION.—Extreme western West Virginia at low altitudes, west to central and northern Illinois and southwestern Michigan, Tennessee between the Blue Ridge and the west branch of the Tennessee River.

REMARKS.—The distributional limits of *rivicola* are known only imperfectly. Material from West Virginia indicates that this race occurs only in the extreme western part of the state, apparently only below the 1,000 foot contour along the Ohio River Valley; whether *rivicola* enters Pennsylvania in the extreme western portion of the state is uncertain, two specimens from Meadville, Crawford Co. (USNM 3718, 2 spec.) being quite typical *bislineata*. The westernmost limits of *rivicola* are Will, LaSalle, and Edgar counties, Illinois; presumably, the Berrien County, Mich., record for *bislineata* (Maldonado-Koerdell and Firschein, 1947: 140), which I have not examined, is referable to *rivicola*.

I have not seen any specimens from Coastal Plain Tennessee, i.e., that portion of the state lying to the west of the Tennessee River, but I suspect that this population will show a prominent tendency toward *rivicola*, if not actual identity with this race. Parker (1947:79) has reported *cirrigera* from northwestern DeSoto Co., Mississippi, but the specimens I have examined from this county (1 mi. E. of Walls, CAS 10847, 10 spec.) are actually intergrades between *cirrigera* and *rivicola*, and on the whole are closer to the latter race. In pattern and dentition they are intermediate, while in the costal groove count (14 in seven specimens, 15 in three) and number of costal spaces between the appressed limbs (3 or 4 in all specimens) they suggest *rivicola*, as does also the lack of cirri in the sexually mature male of this series. If these specimens are correctly identified as intergrades, then it is probable that *rivicola* extends into extreme western Tennessee, and the northernmost parts of Mississippi and Alabama as well.

Eastward in Tennessee, *rivicola* is found as far as Grainger County (Bean Station, USNM 88754, at an altitude of approximately 2,000 feet. King (1939: 557-9) has described specimens of "*Eurycea bislineata* $\times$ *cirrigera*" from low altitudes (below 2,500 feet) in the Great Smokies, in Sevier County, Tennessee, which appear to be *rivicola*; King's description fits *rivicola* in all important respects, except the number of costal spaces between the limbs. Interestingly enough, King reports no instances of intergradation between *wilderæ* and his "*Eurycea bislineata* $\times$ *cirrigera*" (= *rivicola*), which may be due to the fact that the former takes up a semi-terrestrial existence, while the latter, according to King, is restricted to springs, marshy areas, and small streams. Dunn (1926: 303) reports intergradation between *wilderæ* and *bislineata* at Abingdon, Washington Co., Virginia.

The four races of *Eurycea bislineata*, as recognized and defined in this paper, may be identified by the following key:

- 1a. Costal grooves 15 or 16; occasional naso-labial swellings or tubercles, but no cirri present in sexually mature males 2
- 1b. Costal grooves 13 or 14; if cirri are present, costal spaces between the appressed limbs are 2, if cirri are absent there are 3 costal spaces between the appressed limbs 3
- 2a. Combined vomerines 8-21, average 12; dorsolateral stripe usually not extending beyond middle of tail. Southern Quebec to southern Virginia, west to the Ohio River valley in West Virginia *bislineata*

- 2b. Combined vomerines 8-27, average 15; dorsolateral stripe usually extending well beyond middle of tail (to distal fourth or beyond). Ohio River valley in West Virginia, west to central and northern Illinois, and extreme southwestern Michigan, Tennessee between the Blue Ridge and the west branch of the Tennessee River *rivicola*
- 3a. Costal spaces between the appressed limbs usually 2; cirri present in males 4
- 3b. Costal spaces between the appressed limbs usually 3; no cirri present in males. Range as in 2b *rivicola*
- 4a. Combined vomerines 10-24, average 15.8; sides dark with prominent white (or light) spots; dorsolateral stripe extending to tip, or at least the distal fourth, of tail. Southern Virginia to extreme Louisiana in the Coastal Plain and Piedmont *cirrigera*
- 4b. Combined vomerines 4-17, average 11.4; sides light, dorsolateral stripe black (rather than brown) and extending only to the middle of the tail. The Blue Ridge Province, from White Top Mountain, Virginia, to Rabun and Gilmer counties, Georgia *wilderiae*

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- Plate.—Distribution of the races of *Eurycea bislineata* (modified after Bishop, 1943: 405). Intergradation between races is not shown, except

in the case of *wilderæ* $\times$ *cirrigeria*. The inclusion of northern Alabama and extreme northwestern Georgia in the range of *rivicola* is based on the expected, but as yet hypothetical, extension of this subspecies' distribution. The distributional vacuum in northwestern Alabama, northern Mississippi, and western Tennessee is purely artificial; *Eurycea bislineata* cap. occurs in this area, but the status of the form is as yet uncertain. Similarly, some race occurs in extreme western Kentucky, but whether it is *cirrigeria* or *rivicola*, or an intergradant population, is not known. The range boundary of *rivicola* and *bislineata* in northeastern Ohio and western Pennsylvania is artificial; whether the two races interdigitate or replace each other abruptly in this region remains to be determined.

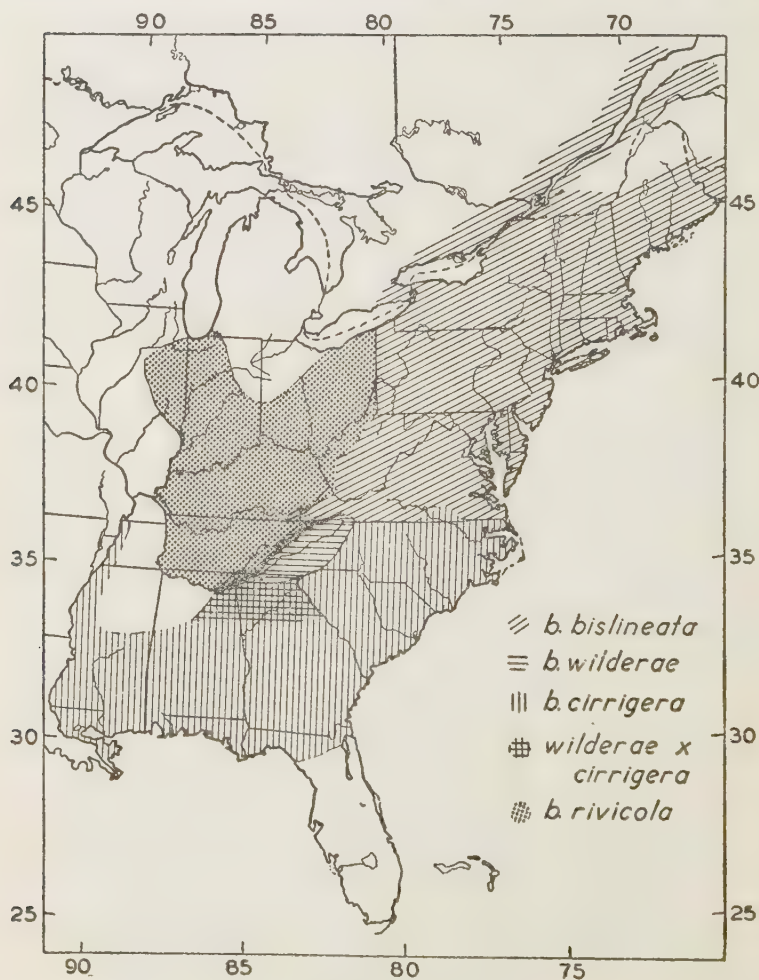


PLATE VI

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

REMARKS ON THE GENUS
OCHETORHYNCHUS MEYEN

BY ALEXANDER WETMORE AND JAMES L. PETERS

As long ago as 1926, in discussing *Upucerthia certhioides* Wetmore¹ remarked "the association of this and allied straight billed forms in the genus *Upucerthia* with species of the *U. dumetaria* type is questionable." Recently while engaged in a general revision of the Furnariidae, Peters came to the conclusion that the continued retention of *certhioides* in *Upucerthia* was not warranted, and proposed to Wetmore that the question of the generic allocation of this species be reopened.

In connection with the study of this question all the known species currently referred to *Upucerthia* were examined as well as nearly all of the described races. One of these (*excelsior*) has already been shown by Bond² to be referable to the genus *Cinclodes*, a disposition in which we entirely concur. Of the other species currently placed in *Upucerthia*, there are three, *dumetaria*, *albigula* and *validirostris*, that are similar structurally in that the bill is slender and longer than the head, with the culmen strongly arched. Two others, *andaecola* and *serrana*, have somewhat stouter and shorter bills, which, however, are arched as in the *dumetaria* group.

The three remaining species, *ruficauda*, *harterti* and *certhioides*, differ noticeably from any of the others mentioned, in having the culmen straight, slightly decurved terminally, and not arched. There seem to be no other structural characters, but in our estimation this striking bill difference is sufficient to be of generic value.

The three species listed above may be placed in the Genus *Ochetorhynchus* Meyen,³ the type of which is *Ochetorhynchus ruficaudus* Meyen.

Examination of a large series of *Ochetorhynchus certhioides* from widely separated parts of its range reveals the existence

¹U. S. Nat. Mus. Bull. 133, 1926. p. 251.

²Proc. Acad. Nat. Sci. Philadelphia, 97, 1945, p. 23.

³Nova Acta Acad. Caes. Leop.-Carol., 16, 1834, suppl. 1, p. 80.

of a hitherto unrecognized race, occupying a larger area than the ranges of either of the two currently recognized forms as restricted below. A brief history of the two currently described forms may be of interest. In 1838 d'Orbigny and Lafresnaye⁴ described *Anabates certhioides* from Corrientes, Argentina. Following this in 1860 Burmeister⁵ named *Ochetorhynchus lusciniæ*, with types from Mendoza. The existence of the name set up by d'Orbigny and Lafresnaye was over-looked by all ornithologists until resurrected by Ménégau and Hellmayr⁶, and the few specimens that were collected along the Paraguay River were referred to *lusciniæ*, which had been transferred to the genus *Upucerthia* by Selater and Salvin⁷. Ménégau and Hellmayr (loc. cit.) pointed out the differences between the eastern and western populations in Argentina, but regarded them as distinct species. Hartert⁸ three years later reduced *lusciniæ* to the status of a subspecies of *certhioides*. While Hartert was correct in his interpretation of relationships, he apparently lacked topotypical material of *lusciniæ*, and assumed that the specimens at hand from the Argentine provinces of Salta, Catamarca and Tucumán represented that form. Hellmayr's treatment in the fourth part of the Catalogue of the Birds of the Americas was essentially the same as that of Hartert. Thus it now appears that the bird we propose to describe is in reality *Upucerthia certhioides lusciniæ* of authors, not of Burmeister, which appears to be restricted in its distribution to the precordillera in the Argentine provinces of La Rioja and Mendoza, while the population from Salta, Catamarca, Tucumán, Santiago del Estero, western Chaco and the Paraguayan Chaco belongs to an undescribed race that we name.

Ochetorhynchus certhioides estebani new subspecies

Type M. C. Z. no. 94198, ad. ♂, Leales Bajo, 700 meters elevation, Tucumán, collected 16 May, 1915 by Luis Dinelli.

Characters.—Similar to *Ochetorhynchus certhioides certhioides* (d'Orbigny and Lafresnaye), but dorsal coloration much paler brown; ventral coloration duller, especially the flanks, which lack any rufous tinge; bill relatively as well as absolutely shorter; wing longer, with tail equal to or slightly longer than wing. Similar also to *O. c. lusciniæ* Burmeister but more brownish, less grayish above and below; smaller in all dimensions.

⁴Syn. Av., in *Mag. Zool.*, **3**, 1838, cl. 2, p. 15.

⁵*Journ. f. Orn.*, **6**, 1860, p. 249.

⁶*Mem. Soc. Hist. Nat. Autun*, **19**, 1906, p. 56.

⁷*Nomencl. Av. Neotrop.*, 1873, p. 62.

⁸*Nov. Zool.*, **16**, 1909, pp. 207-208.

This new form is named for Dr. Juan G. Esteban of the Instituto Miguel Lillo in Tucumán, in recognition of his current work in the family Furnariidae.

The races and ranges of *Ochetorhynchus certhioides* may be summarized thus—

O. c. lusciniæ Burmeister.

Ochetorhynchus Lusciniæ Burmeister, Journ. f. Orn., 8, no. 46, July, 1860, p. 249. (Mendoza.)

The largest and palest form, the brown coloration with a distinct grayish cast; wing longer than tail. 1 ♂, La Rioja, wing 74.5; tail 76.1; culmen 24.9 mm., 3 ♀, Mendoza, wing 70.9-75.2 (72.7); tail 73.8-82.3 (77.9); culmen 22.6-24.5 (23.5) mm.

Range: Precordillera of western Argentina in provinces of Mendoza and La Rioja; presumably also in San Juan.

O. c. estebani Wetmore and Peters.

Browner, less grayish, than *O. c. lusciniæ*; somewhat smaller.

	Wing	Tail	Culmen
1 ♂ Salta	70.5	70.7	20.4
1 ♂ Catamarca	68.4	69.1	22.8
3 ♂ Tucumán	70.6-72.3 (71.5)	72.1-73 (71.6)	20.7-21.8 (21)
5 ♂ Santiago del Estero	69-72.4 (70.6)	68-75.5 (71.6)	20.5-23.1 (21.6)
1 ♂ Chaco (western)	68.5	69	22.1
5 ♂ Paraguay- an Chaco	65.8-68.7 (67.3)	65.2-68.5 (66.9)	20.4-21.4 (20.6)
3 ♀ Tucumán	67-70.3 (68.6)	67-71.3 (69.6)	18.3-20.7 (19.6)
8 ♀ Santiago del Estero	65-72.5 (68.8)	66.8-75.7 (71.1)	19.7-22.8 (21.8)
3 ♀ Chaco (western)	65.4-69.2 (67)	64.6-69.8 (66.9)	19.7-22.9 (20.4)
1 ♀ Paraguay- an Chaco	67.4	69.5	21.7

Range:—Northern and northwestern Argentina in provinces of Salta, Catamarca, Tucumán, Córdoba, Santiago del Estero, and Gobernación del Chaco (General Pinedo), extending into the Paraguayan Chaco to a point 265 km. west of Puerto Casado. Paraguayan specimens are somewhat intermediate in size and proportions between this race and *O. c. certhioides*, but are nearer to *estebani* in shorter bill and paler coloration.

O. c. certhioides (d'Orbigny and Lafresnaye)

Anabates certhioides d'Orbigny and Lafresnaye, Syn. Av., in Mag. Zool., 8, cl. 2, 1838, p. 15. (Corrientes.)

The most deeply colored race, with the shortest wings and tail, the latter member averaging slightly shorter than wing, whereas in the other two races the tail slightly exceeds the wing; bill longer than in *estebani*, but shorter than in *lusciniæ*.

	<i>Wing</i>	<i>Tail</i>	<i>Culmen</i>
2 ♂ Formosa	67.3-68.5 (67.9)	64.9-65.3 (65.1)	23.-23.6 (23.3)
2 ♂ Chaco			
(eastern)	65.1-66.5 (65.8)	62.9-65.6 (64.2)	21.6-22.9 (22.2)
1 ♂ Santa Fe	67.3	63.1	22.1
2 ♀ Chaco	61.2-68.7 (64.9)	62.3-67.6 (64.9)	22.8-22.9 (22.85)
1 ♀ Santa Fe	64.3	63.8	23.4

Range.—Eastern Formosa, and Chaco (Las Palmas) south to Santa Fe (Mocoví), Corrientes⁹ and Entre Ríos,⁹ Argentina.

The forms included in *Ochetorhynchus* under the arrangement set up in this paper will stand as follows:

Ochetorhynchus harterti (Berlepsch)

Ochetorhynchus certhioides certhioides (d'Orbigny and Lafresnaye)

Ochetorhynchus certhioides estebani Wetmore and Peters

Ochetorhynchus certhioides luscini Burmeister

Ochetorhynchus ruficaudus ruficaudus Meyen

Ochetorhynchus ruficaudus montanus (d'Orbigny and Lafresnaye)

MATERIAL EXAMINED

O. c. luscini.—MENDOZA: near Mendoza, 3 ♀¹. LA RIOJA: Chilecito, 1 ♂¹.

O. c. estebani.—SALTA: Arenal, 1 ♂², CATAMARCA: Catamarca, 1 ♂². TUCUMAN: Vipos, 1 ♂²; Tapia, 1 ♂³, 3 ♀^{1,2,3}; Leales Bajo, 1 ♂ (type). SANTIAGO DEL ESTERO: Lavalle, 5 ♀²; Suncho Corral, 4² ♂, 4 ♀². CHACO: General Pinedo, 1 ♂², 3 ♀². PARAGUAYAN CHACO: General Diaz, 1 ♂⁴, 1 ♀⁴; Orloff 1 ♂⁴; Colonia Fernheim 2 ♂⁴; 265 km. W. of Puerto Casado 1 ♂⁵.

O. c. certhioides.—FORMOSA: Kil. 182, 2 ♂¹. CHACO: Las Palmas, 1 ♂¹, 1 ♀; SANTA FE: San Vicente, 1 ♂²; Ocampo, 1 ♀², Mocoví, 1 ♂², 1 ♀².

We are indebted to the authorities of the American Museum of Natural History, Chicago Natural History Museum and the Museum of Zoology, University of Michigan, for the loan of material, in addition to that contained in the United States National Museum and the Museum of Comparative Zoölogy.

Smithsonian Institution, Washington 25, D. C.

Museum of Comparative Zoölogy, Cambridge 38, Mass.

⁹Specimens from these provinces not seen.

¹Specimens in U. S. National Museum.

²Specimens in American Museum of Natural History.

³Specimens in Museum of Comparative Zoölogy.

⁴Specimens in Chicago Natural History Museum.

⁵Specimens in Museum of Zoology, University of Michigan.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW RACE OF *PIPILO FUSCUS* FROM MEXICO

BY ROBERT T. MOORE

Since the publication of "Notes on *Pipilo fuscus* of Mexico" (Proc. Biol. Soc. Wash., 55, 45-48, May 12, 1942), more than 100 new specimens of this species have been added to the Moore Collection, coming chiefly from northeastern Mexico and the Central Plateau. It is now indicated that an undescribed race occurs in Hidalgo. It is herewith described:

Pipilo fuscus campoi, subsp. nov.¹

Type.—Male adult acquiring fresh winter plumage, number 34212, collection of Robert T. Moore; Metztitlán, Hidalgo, Mexico; September 27, 1942; collected by Mario del Toro Avilés.

Subspecific characters.—Nearest in coloration to *P. f. toroi* of Oaxaca (both races having a gray pileum concolor with back), it differs in being (1) darker above; (2) slightly darker below with less extensive white on belly; and (3) size apparently smaller, but most of the individuals are either badly worn or acquiring their winter plumage. About the size of *P. fuscus fuscus* of the State of Mexico, it differs by having (1) the pileum uniform with back, instead of browner; (2) paler buff on throat and (3) whiter on breast. Compared with *potosinus* of Guanajuato, (1) the pileum is much less brown, and (2) size probably smaller. Compared with the birds of the Valley of Mexico, which, although slightly paler, are nearer to true *fuscus*, *campoi* is paler below and darker above (pileum less brown). Compared with the topotypical series of *texanus* from Kerrville, Texas, with which I have made direct comparison, *campoi* differs markedly in (1) not having the very rusty pileum; (2) in being darker above and below (especially on the flanks), and (3) whiter on the belly. Our 41 specimens from Coahuila, Nuevo Leon, San Luis Potosí and Tamaulipas have pileums dark brown (not rusty as in *texanus*), much browner than the back. Some authors may differentiate them as a fairly well-marked intermediate race between *texanus* on the north and *potosinus*. Here they are treated as intergrades between these forms, but closer to *potosinus*.

Range.—*Campoi* attains its typical characters in the arid area of Metztitlán, Hdg., from which the Moore Collection possesses sixteen specimens, all quite uniform. Our eleven brown towhees from other lo-

¹It is a pleasure to name this interesting form for Dr. Rafael Martín del Campo, Curator of Birds in the Instituto de Biología, Mexico City, in recognition of the assistance he has given to the Compiling Group, in the preparation of the Check List of the Birds of Mexico.

calities in Hidalgo, (Real del Monte, Portezuelo, Jolotepec and Huichopán) although increasing in darker coloration of the pileum, as they occur farther west, approach *potosinus*. The birds of El Caracol, Querétaro, are about intermediate but slightly closer to *potosinus* and those farther west are definitely of this richer colored form. To the south in the Valley of Mexico the birds are nearer to the nominate race, whose type came from Tlascaltepec in the southwestern part of the State of Mexico.

Average Measurements.—The average of 10 adult males (5 in fresh plumage) from Metztitlán, Portezuelo, Jolotepec and Real del Monte shows wing 92.7 and tail 93.9 m.m. The average of 5 adult males of *fuscus* in good plumage (3 from Temascatepec and 2 from Lerma, State of Mexico, shows wing 93.4 and tail 91.4. For comparison with the other larger races, see the Table of Measurements in Proc. Biol. Soc. Wash., 55, p. 47.

Specimens Examined.—In addition to sixteen specimens of *campoi* from the type locality, eleven of *campoi* from other localities (Real del Monte, Jolotepec, Huichopán, and Portezuelo) in Hidalgo, as well as the 41 intergrades mentioned above from northeastern Mexico, I have re-examined the large series in the Moore Collection listed in the reference above-mentioned and in addition nearly one hundred new specimens from the Central Plateau; also, the ten topotypical specimens of *texanus*.

Remarks.—The new race from Hidalgo is a rather pale small race (wing and tail about equal in length) with pileum gray like the back, which is practically surrounded by richer colored, larger birds with brown heads to the north, west and south. Two specimens from a locality to the East near Huachinango, Puebla, have the uniform back and pileum of *campoi*, but are conspicuously darker above and below in both the grays and buffs and seem to lie between the intergrades from the northeast and *campoi*, being the only group of them showing any approach to *campoi*. Farther east is the Tropical Zone of Veracruz, where this species does not occur. In the far south, separated from *campoi* by the richer colored, brown-headed birds of the high valley of Mexico, we find on the deserts of eastern Oaxaca the paler race, of *toroi*, with which it has its closest affinities.

My grateful acknowledgments are made to Mr. J. L. Peters and the Museum of Comparative Zoology and to Mr. E. R. Blake and the Chicago Museum for the loan of the topotypical series of *texanus*; also to Dr. Alden H. Miller for arranging for the transfer of this material, while it was on loan to him. Mr. John Davis of the University of California, while doing work for his Doctor's degree in the collection of the Orevutt Trust, was very helpful in measuring the nearly 300 Mexican Brown Towhees in our collection.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW HUMMINGBIRD OF THE GENUS *LOPHORNIS*
FROM SOUTHERN MEXICO

BY ROBERT T. MOORE

The receipt of two specimens of the species *Lophornis delattrei*, taken in the state of Guerrero by Chester C. Lamb in May, 1947, extends the range of the genus nearly twelve hundred miles north from Costa Rica, whence *Lophornis delattrei lessoni* has been reported by Bangs. The new specimens represent a well-marked race, which is described below.

Lophornis delattrei brachylopha, subsp. nov.

Type.—Adult male, number 46,062, collection of Robert T. Moore; San Vicente de Benitez, Guerrero, México; altitude 1,500 feet; May 9, 1947, collected by Chester C. Lamb.

Subspecific characters.—Nearest to *Lophornis delattrei lessoni* Simon, but differs in having (1) crest much shorter (about one-half as long), with no spangles on the tips of the feathers; (2) blackish shaft-streaks on the lateral crest feathers; (3) greens much darker throughout, particularly on back, hind-neck and wing-coverts; (4) tufts on side of neck longer, with larger streaks of green as compared with the smaller spots of *lessoni*; (5) tips of rectrices with a wide band of black, especially conspicuous below, instead of practically none, or golden green ones; (6) bill (both maxilla and mandible) entirely black instead of cinnamon (in dried skins); (7) rump much darker green, the feathers broadly tipped with iridescent Pomegranate Purple¹; (8) bases of feathers or lower half of belly cinnamon-buff tipped with darker green, instead of uniform pale golden green; (9) size larger. *Brachylopha* differs from *Lophornis delattrei delattrei* (Lesson) of Perú and Bolivia in all the characters given above, except size, but to a greater degree.

Range.—Known from two adult males, both taken in May at the same locality, San Vicente de Benites, about thirty-five miles northwest of Acapulco, Guerrero, in the Sierra del Sur, at an altitude of 1,500 feet.

Average Measurements of Males in Millimeters

<i>Wing</i>	<i>Tail</i>	<i>Exposed Culmen</i>	<i>Crest</i> ²
<i>2 brachylopha</i>			
40.9 (39.9-41.9)	25.1 (24.7-25.4)	9.8 (9.7-9.9)	11.1 (10.5-11.7)
<i>9 lessoni</i>			
36.6 (35.2-37.9)	19.7 (20.7-24.0)	7.6 (7.8-9.2)	20.3 (17.9-21.5)
<i>1 delattrei</i>			
40.3	22.5	10.3	23.7

¹Names of colors when capitalized are taken from Ridgway's Color Standard and Nomenclature, 1912.

²The length of the crest is measured from the base of the anterior long crest feathers to the tips of the longest ones.

SPECIMENS EXAMINED

Brachylopha: 2 adult males from Guerrero in Moore Collection.

Lessoni: 1 ad ♂, Clitra, Veraguas, Columbia; 5 ad ♂s, "Bogota", 1 ad ♂ "Columbia"; 2 im. from Columbia; and one of uncertain origin; 2 ad ♂s from Panamá; 2 im. ♂s from San Pedro, Costa Rica.

Delattrei: 1 ad ♂, 1 im., Buena Vista, Bolivia.

My acknowledgements are gratefully made to Dr. Herbert Friedmann and the United States National Museum, to Mr. James Peters and the Museum of Comparative Zoology, and to Mr. W. E. Clyde Todd and the Carnegie Museum for their courtesy in providing the comparative material necessary for the completion of this paper.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES BELONGING TO THE GENUS
MYZOCALLIS (APHIDIDAE)

F. C. HOTTES

The species described herewith and believed to be new to Science has been under rather close observation for two seasons. The opportunity is taken to discuss briefly its affinity to several other very closely allied species one of which has been heretofore considered a synonym.

Myzocallis tonkawa, new species

Alate viviparous female.

Size and general color.—Average length from vertex to tip of anal plate 2.06mm. Range in size from 1.71-2.43mm. Both extremes represented by a single specimen. Most common length about 2.21mm. Width of head through the eyes .43mm. The color of this species is quite variable. Some specimens are pale yellowish-green, others are dusky yellow, while still others may have the head and prothorax a pale pink or orange with the abdomen green. As a rule the margins of the head show more or less dusky and the same may be said for the whole of the mesothorax which may also be light brown. The cornicles are concolorous with the abdomen, but may be slightly lighter in color. The cornicles are never dusky. Cauda and anal plate more or less concolorous with abdomen with the margins light dusky. First and second antennal segments dusky brown, darker on median margins. Third, fourth, fifth and sixth antennal segments light dusky with varying amounts of darker dusky to brown near the apex. The secondary sensoria on the third segment are commonly surrounded by dusky patches. Femora pale dusky-green with dorsal portions darker. Tibiae with a brownish spot near the knee, remaining portion light dusky as a rule but sometimes rather dark. Apex of tibiae not much if any darker than region above.

Stigma dusky. Veins brown surrounded by fuscous and ending in dusky areas before margin of wing. Anal vein as a rule darkest and surrounded by darkest area. Anal cubital and radial sector originating in dusky areas.

Head and appendages.—Comparative length of antennal segments as follows: III .786-.858 ave. .84mm., IV .51-.60 ave. .55mm., V .443-.514 ave. .47mm., VI .20-.228 ave. .22mm., + .312-.328mm. Secondary sensoria confined to the third antennal segment and numbering from seven to fifteen each represented by a single antenna. Ten to twelve sensoria are common. The first two or three sensoria are slightly oval the other sensoria are round. All sensoria have wide rims. The rostrum reaches about half way to the coxae of the mesothoracic pair of legs. The anterior

margin of the head has a well developed tubercle. The dorsum of the head has two pair of wart-like tubercles each terminated by a short hair. These structures are difficult to determine unless the specimen is mounted on the side.

Thorax and appendages.—The dorsum of the prothorax has two pair of finger-like tubercles which are subequal in length. The dorsum of the mesothorax has a single pair of tubercles which have a much wider base than those on the prothorax. The radial sector is long and forms an acute angle with the margin of the wing. The second branch of the media is midway between the first branch and the margin of the wing. The outer surface of the wing is scale-like. The hind tibiae are from 1.35-1.44mm. long. The hair on the tibiae is sparse. The hind tarsi are from .1-.128mm. long.

Abdomen.—The segments anterior to the cornicles are provided with well-developed lateral tubercles, these are blunt at the tip and rather wide at the base. The dorsum of the abdomen has six pair of finger-like tubercles. Of these the first two pair are about equal in length and as a rule better developed than the third and fourth pair. The fifth and sixth pair of tubercles on the abdomen are often represented by mere nubbins. The cornicles are typical of the genus and vary in length from .1-.128mm. The anal plate is deeply divided and the cauda knobbed. Both the anal plate and the cauda are provided with long rather spine-like hair.

Alate male.

Size and general color.—Length from vertex to tip of anal plate 1.67mm., width of head through the eyes .43mm. Head dusky with the margins darker. Prothorax dusky green. Mesothorax brown. Abdomen with anterior portion greenish and the portion posterior to the cornicles light yellowish. Cornicles light dusky. Cauda and anal plate dusky brown. Gonapophyses dark brown with a lighter area near the base. Femora uniform dusky. Tibiae brown at the base remainder uniform dusky. Antennal except for segments I and II which are darker light dusky.

Head and appendages.—Antennal segments with the following proportional lengths: III .786mm., IV .457mm., V .429mm., VI .214+.347mm. Secondary sensoria arranged as follows: III 43-48, IV 18-25, V 11-14, VI 1. The sensoria are uniformly distributed. Rostrum short. Dorsal tubercles lacking.

Thorax and abdomen.—Wings as in alate viviparous female. Hind tibiae 1.21mm. long. Hind tarsi .128mm. long. Tubercles apparently lacking on both thorax and abdomen. Anal plate entire, cauda knobbed. Gonapophyses large and very well supplied with hair, some of which originate, in light colored areas.

This species may be collected on the under side of the leaves of *Quercus gunnisonii* a scrub oak. It is never abundant and may best be taken by sweeping with a net. I have often taken it along with *Myzocallis alhambra* Davidson. However it appears later than *alhambra* in the spring and remains several weeks in the fall after *alhambra* has disappeared.

This species is very closely allied to three other species which have much in common. The species are *Myzocallis kiowanica* which I described from the same general region, *Myzocallis californicus* Baker and *Myzocallis maureri* Swain which has I think unjustifiably been considered a synonym of *californicus*. *Myzocallis tonkawa* differs from the above

mentioned species as follows: the greater number of tubercles on the dorsum of the abdomen, the greater number of secondary sensoria on the third antennal segment, although *californicus* may have as many sensoria at times as are represented by the minimum number in *tonkawa*. In *californicus* the first pair of abdominal tubercles is shorter than the second pair, which is not true in *tonkawa*. The radial sector is longer in *tonkawa* and forms a differed angle with the margin of the wing than the radial sector of the other three species. The shape of the radial sector and hence the shape of cell R_1 is also different.

Prof. Palmer and Prof. Essig have kindly supplied me with material of both species for study. This material contained males which may be easily separated into two species on the basis of color marking on the dorsum of the abdomen and secondary sensoria as well as size. These males differed from the male here described, and should furnish a basis for separating *californicus* from *maureri* should other factors, such as size, the number of secondary sensoria, the shape of the radial sector and the angle it makes with the margin of the wing, and the relative length of the radial sector to the length of the anal vein fail as valid factors to differentiate the two species.

Holotype slide deposited in the United States National Museum with the following data:

U.S. National Monument Grand Junction, Colorado, Sept. 22, 1947

Quercus gunnisonii Alate viviparous females.

Allotype alate male Oct. 24, 1947 U.S. National Grand Junction,

Colo. Thirty paratypes taken on various dates during 1947-48.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

ELEVEN NEW SUBSPECIES OF BIRDS FROM
VENEZUELA

BY WILLIAM H. PHELPS AND WILLIAM H. PHELPS, JR.

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The apparently new birds here described are in the Phelps Collection, Caracas, and, unless otherwise specified, the specimens listed as examined are also in that collection.

Names of colors are capitalized when direct comparison has been made with Ridgway's "Color Standards and Color Nomenclature".

Tinamus tao larensis, new subspecies

Type: From Cerro El Cogollal, Quebrada Arriba, Lara, Venezuela; altitude 1600 meters. No. 18385, Phelps Collection, Caracas, Venezuela. Adult male collected June 29, 1942, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from *T. t. septentrionalis*, and more so from *T. t. tao*, in being lighter above, olive with dusky brown barring and speckling instead of bluish gray with black markings. Below paler, more brownish gray, less bluish gray. Differs additionally from *T. t. tao* in having paler under tail-coverts.

Range: Mountainous region of north-central and northwestern Venezuela from the Federal District west to Lara; Mérida and, in Colombia, native "Bogotá" collections.

Description of Type: Top of head and neck gray with dusky shaft streaks to the feathers, hind neck with fine white speckles; back, rump and upper tail-coverts Dark Olive-Buff, speckled and barred with blackish,

with scattered small whitish spots on tail-coverts; sides of head dusky, speckled with white. Chin white; throat white, more buffy posteriorly, the feathers tipped or edged with black; breast, abdomen, sides and flanks olivaceous gray with fine dusky speckling; lower abdomen more whitish; thighs more olivaceous with dusky barring instead of speckling; under tail-coverts Pinkish-Cinnamon X Cinnamon. Upper surface of primaries dusky, the inner vanes with bluish sheen; under surface brownish, inner half of inner webs grayish blue; exposed surface of secondaries and tertials, and upper wing-coverts uniform with back; under surfaces grayish finely barred or speckled with buffy-olive; greater under wing-coverts brownish, lesser ones grayish or dusky speckled with whitish or dusky. Tail pale olivaceous finely speckled and barred with dusky.

Maxilla (in life) "black"; mandible "purplish-white"; feet "dark gray"; iris "dark". Wing, 268 mm; tail, 95; exposed culmen, 35; culmen from base, 43; tarsus, 76.

Remarks: Sexes alike. Size similar to *occidentalis*. Range of measurements: two adult males (incl. type)—wing, 255, 268 (261.5); tail, 95, 95 (95); culmen from base, 41, 43 (42); three adult females—wing, 273-285 (279.3); tail, 110-123 (114.7); culmen from base, 43-49 (45.3). *T. t. septentrionalis*: two adult males—wing, 272, 275 (273.5); tail, 115, 122 (118.5); culmen from base, 41, 46 (43.5); three adult females—wing, 280-293 (286); tail, 98-115 (104.3); culmen from base, 41-46 (43.7).

The race *septentrionalis* is intermediate in coloration between the new sub-species and the typical form.

SPECIMENS EXAMINED

T. t. tao.—BRAZIL¹: Rio Tapajoz, 1 ♂, 2 ♀; Rio Xingu, 1 ♂, 1 ♀; Rio Machados, 1 ♂, 1 ♀.

T. t. septentrionalis.—VENEZUELA: Cerro Azul, 1 ♀; Cerro Humo, 2 ♂, 1 ♀; Cerro Negro (Monagas), 1 ♂; "Plain of Cumana" 1 ♀¹.

T. t. larensis.—VENEZUELA: Cerro El Cogollal, 1 ♂ (type), 2 ♀; Urama, 1 ♀; Colonia Tovar, 1 ♂; Lagunita de Aroa, 1 ♂²; Cumbre de Valencia, 1 juv. (?)²; Puerto de la Cruz (Dist. Fed.), 1 ♀²; La Azulita, 1 ♂³; Maracay, 1 ♀³. COLOMBIA¹: "Bogotá", 1 (?)¹; no locality, 1 (?)¹.

T. t. kleei.—PERU¹: Pozuzo, 1 ♂, 2 ♀; Chanchamayo, 1 ♂, 1 ♀.

Pyrrhura picta cuchivera, new subspecies

Type: From Cerro El Negro, Upper Cuchivero River, State of Bolívar, Venezuela; altitude 1300 meters. No. 42330, Phelps Collection, Caracas, Venezuela. Adult male collected November 25, 1947, by Manuel Castro. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from *P. p. picta*, *P. p. amazonum* and *P. p. lucianii* in whiter throat; chin, neck, throat and anterior breast have the black markings of the feathers narrower and more elongated and the white margins correspondingly wider.

Range: Known only from Cerro El Negro, Alto Río Cuchivero, in the Lower Subtropical Zone at altitudes from 900 to 1300 meters.

Description of Type: Forehead and anterior crown bluer than Niagara

¹Specimens in the American Museum of Natural History.

²Specimens in the Carnegie Museum.

³Specimens in the Chicago Natural History Museum.

Green; posterior crown and nape Natal Brown X Bone Brown, the feathers very narrowly edged with grayish, the posterior ones with bluish Niagara Green forming a narrow, partially concealed, collar; nape, scapulars and upper tail-coverts Cosse Green X Lettuce Green; back and rump Morrow Red; lores and sides of head Claret Brown; auriculars, except bases, grayish white; feathers of gular region with bluish centers. Chin whitish, throat and sides of neck grayish white the throat feathers with narrow blackish shaft streaks, wider on neck; breast with still wider blackish shaft markings, the edgings posteriorly tinted with yellowish green; anterior abdomen, sides, shanks and under tail-coverts Javel Green. Primaries Light Cerulean Blue; secondaries and tertials green uniform with scapulars; all remiges with very pale edges to inner vanes and dusky tips except the tertials; alula and greater wing-coverts blue uniform with primaries; median and lesser coverts green uniform with secondaries and tertials; bend of wing Scarlet-Red; greater under wing-coverts grayish olive, lesser ones and axillaries green, uniform with sides. Tail Claret Brown, more dusky below, the rectrices edged externally and basally (except the outermost), and tipped narrowly, with green, uniform with scapulars.

Bill (in life) "grayish black", feet "grayish black", iris "brown". Wing, 114 mm; tail, 105; culmen from cere, 14; exposed culmen, 16; culmen from base, 19.5; tarsus, 13.5.

Remarks: Sexes alike. Size similar to *picta*. Range of measurements: five adult males—wing, 114-118 (115.6) mm; tail, 101-111 (105.2); culmen from cere, 14.5-15 (14.7); one adult female—wing, 117; tail, 93; culmen from cere, 14; one adult of undetermined sex—wing, 115; tail, 105; culmen from cere, 14. Measurements of *picta*: five adult males from La Paragua, Bolívar—wing, 119-120 (119.6); tail, 98-114 (109.4); culmen from cere, 14-16 (14.6).

The locality of this new subspecies lies to the north and west of the known range of *picta*. The species is not known from the Upper Orinoco River.

SPECIMENS EXAMINED

P. p. cuchivera.—VENEZUELA: Cerro El Negro, 5 ♂ (incl. type), 1 ♀, 1 (?).

P. p. picta.—VENEZUELA: Manoa, 2 ♂; Altiplanicie de Nuria, 2 ♂, 2 ♀; Cerro Tomasote, 1 ♀; El Palmar, 1 ♂; El Dorado, 1 ♂, 1 ♀; La Paragua, 7 ♂, 3 ♀; Cerro Tigre, 2 ♂, 1 ♀; Altagracia, Upata, 2 ♂²; Río Yuruán, 1 ♀²; El Perú Mine, 5 ♂²; La Prisión, 4 ♂¹; La Unión¹, 3 ♂, 7 ♀; Suapure, 1 ♀¹. BRITISH GUIANA¹: Annai, 1 ♂; "Demarara", 1 (?); "British Guiana", 1 ♂. DUTCH GUIANA¹: Paramaribo, 1 ♀; "Interior of Surinam", 1 ♂, 1 (?); Rivata, 2 ♂, 2 ♀. FRENCH GUIANA: Tamanoir, 1 ♀¹; Pied Saut, 1 ♂¹; var. locs., 18².

P. p. amazonum.—BRAZIL¹: Santarem, 2 (?); "Amazon", 1 (?); Obidos, 2 ♂, 1 ♀; Calama, Rio Madeira, 3 ♂, 3 ♀; Humaytha, 1 ♂; Allianca, 1 ♂; Porto Velho, 1 (?); Rio Roosevelt, 1 ♂, 2 ♀.

*P. p. lucianii*¹.—BRAZIL: Rio Juruá, 1 ♂. PERU: La Pampa, 1 ♂; "Napo", 1 (?); Río Ucayali, 2 ♂, 2 ♀, 2 (?); Paleaza, 1 ♂, 1 (?). ECUADOR: Oroso, 4 ♂.

Leucippus fallax occidentalis, new subspecies

Type: From Sabaneta, State of Falcón, Venezuela; altitude 60 meters.

No. 5579, Phelps Collection, Caracas, Venezuela. Adult male collected March 24, 1940, by William H. Phelps. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from *L. f. fallax* of the Caracas region by paler brown crown, much paler back, more grayish, less bluish green; under parts also paler, more yellowish, less salmon color. Differs from *L. f. richmondi* of Margarita Island and of the Caribbean coasts of Sucre and Anzoátegui, by darker under parts.

Range: The northwestern arid coast from the Paraguaná Peninsula through Falcón and Zulia to the Goagira Peninsula; State of Lara (El Tocuyo; Barquisimeto). Northeastern Colombia on the Guajira Peninsula (Río Hacha; Parashi).

Description of Type: Crown, back and uropygium Light Yellowish Olive, the feathers of upper tail-coverts edged with grayish; forehead more pale brownish; a small post-ocular whitish spot; sides of head paler brownish gray. Chin, throat, breast, sides and flanks Light Vinaceous-Cinnamon X Vinaceous-Cinnamon merging into the white of abdomen and under tail-coverts. Wings Benzo Brown, the remiges, greater and median upper wing-coverts very narrowly edged with grayish; lesser coverts Light Yellowish Olive; under wing-coverts and axillaries uniform with breast. Rectrices Light Elm Green, tipped with white except the median ones, more broadly towards the outermost; a dusky area between the green and the white tips.

Maxilla (in life) "black"; mandible "pink, tip black"; feet, "black". Wing, 60 mm; tail, 34; exposed culmen, 21; culmen from base, 27; tarsus, 7.

Remarks: Sexes alike. Wings longer than in *fallax*. Range of measurements: five adult males—wing, 60-63 (61) mm; tail, 32-34 (32.8); exposed culmen, 20-21 (20.8); five adult females—wing, 52-60 (57); tail, 31-34 (32.4); exposed culmen, 20-22 (21). Measurements of *fallax*: three adult males—wing, 54-58 (55.8); tail, 33-34 (33.6); exposed culmen (2), 22, 23 (22.5); two adult females—wing, 52, 58 (55); tail, 32, 35, (33.5); exposed culmen (1), 22; two adults of undetermined sex—wing, 54, 58 (56); tail, 32, 33 (32.5); exposed culmen, 21, 22 (21.5).

Peters⁵ says that *fallax* inhabits the littoral of Venezuela and he synonymizes *richmondi* with it. He calls the birds of the coast of northeastern Colombia *cervina* and comments that it is "doubtfully distinct from *L. f. fallax*".

The type of *cervina* was examined by the junior author in the British Museum during the summer of 1948. It has two labels, one reading: "Wilson. *Leucippus cervinus*. Gould. No. 236"; the other: "Gould Coll. *Doleromyia fallax*. Type of *Dolerisca cervina* Gould. Mon. Troch. Intr., p. 56. (8 vo. Ed.) d." This specimen is similar to *fallax* of the Caracas region and dissimilar to *richmondi* of the northeastern Venezuelan coast and Margarita Island in having the darker, browner head, darker green back and darker under parts of the typical form. It seems unquestionable that this specimen, the type of *cervina*, of unspecified locality, came from the Caracas region and that the name should not be used to designate the paler form of the northwestern coast and the Colombian Guajira Peninsula.

The specimen in the British Museum listed as "b"⁶ has a label reading: "*Doleromyia fallax*, Venezuela. Probably the type of *T. fulviventris* Gould. PZS, 1846:88. b." We have listed it provisionally as a synonym

of *fallax* pending an opportunity to compare it with a series of topotypical from the Caracas region which is lacking in the British Museum.

SPECIMENS EXAMINED

L. f. occidentalis.—VENEZUELA: Barquisimeto¹, 3 ♂, 1 ♀; El Tocuyo², 5 ♂, 1 ♀; Cumarebo, Falcón, 1 ♂; Moruy, 1 ♂, 2 ♀; Cerro Santa Ana, 1 ♀; Sabaneta, 1 ♂ (type); Urumaco, 1 ♂, 2 ♀; Dabajuro, 1 ♀; Casigua, 1 ♂; Río Aurare, 1 ♂³; Empalado Sabana, 1 ♀³; Cojoro, Pen. de la Goagira, 1 ♂, 1 ♀, 1 (?). COLOMBIA: Río Hacha², 1 ♂, 3 ♀; Parashi, Pen. de la Guajira, 2 (?)⁴.

L. f. fallax.—VENEZUELA: Turiamo, 1 ♀; Puerto Cabello, 3 ♂, 1 ♀, 2 (?); Macuto, 3 ♂³; "Venezuela", 2 (?)¹.

L. f. richmondi.—VENEZUELA: Porlamar, Isla de Margarita, 5 ♂, 2 ♀, 1 (?), 9 (?)⁴; Isla de Coche, 1 ♀; Isla Tortuga, 2 ♂, 2 ♀; Carúpano, 3 ♀, 1 ♂⁴; San Antonio del Golfo, 1 ♂, 1 ♀; Laguna Grande del Obispo, 1 ♂, 2 (?)⁴; Golfo de Cariaco, 1 (?)⁴; Cumaná, 1 (?)⁴, 2 ♀, 1 (?); Puerto de la Cruz, 1 (?); Barcelona, 7 ♂, 4 ♀, 1 (?)⁴; Píritu, 1 ♂.

Xiphorhynchus guttatus margaritae, new subspecies

Type: From El Cafetal, Margarita Island, Venezuela, altitude 740 meters. No. 3837, Phelps Collection, Caracas, Venezuela. Adult male collected July 29, 1939, by Alberto Fernández Y. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from *X. g. jardinei*, from the adjacent mainland, and from *X. g. susurrans* from Trinidad and Tobago, in having fewer and larger spots on the throat and breast and in lacking the scale-like appearance of the throat; it differs additionally from *jardinei* in being paler brown below, more grayish, less ochraceous; differs from *X. g. demonstratus* in having a more spotted, less striped breast as well as a paler breast and abdomen, more grayish, less olivaceous.

Range: Known only from Margarita Island.

Description of Type: Top of head and nape dusky brown with pale buffy spots, larger and more elongated posteriorly; back Cinnamon Brown, more rufous on rump and upper tail coverts; interscapular region more olivaceous, the feathers with large pale buffy elongated shaft stripes with blackish borders; lores dusky; a white superciliary stripe, the feathers bordered with dusky; ear-coverts and sides of neck dusky with buffy shaft streaks. Chin and forethroat buffy white; rest of under parts Tawny-Olive, posterior throat and breast spotted with pale buffy; under tail-coverts and thighs more brownish. Remiges Auburn, the under surface much paler, and the primaries more dusky towards the tips; upper wing-coverts Tawny-Olive; under wing-coverts Cinnamon.

Bill (in life) "gray"; feet "gray"; iris "brown". Wing, 105 mm; tail, 85; exposed culmen, 36; culmen from base, 39; tarsus, 24.

Remarks: Sexes alike. Size slightly smaller than *jardinei* and *susurrans*. Range of measurements: three adult males—wing, 103-106 (104.5) mm; tail, 85-90 (87.5); culmen from base, 37-39 (38); one adult female—wing, 97; tail, 80; culmen from base, 37; one adult of undetermined sex—wing, 104; tail, 81; culmen from base, 37. Measurements of *jardinei* (from the Paria Peninsula): five adult males—wing, 106-111

⁴Specimens in the British Museum.

⁵Check-List of the Birds of the World. Cambridge, Vol. 5, p. 59, 1945.

⁶Cat. Birds British Museum. 16, p. 177, 1892

(108.2); tail, 88-92 (89.8); culmen from base, 40-41 (40.4); five adult females—wing, 106-111 (109.2); tail, 82-90 (86); culmen from base, 37-39 (38). Measurements of *susurrans*: five adult males—wing, 108-114 (111.6); tail, 79-90 (86); culmen from base, 40-41 (40.4); five adult females—wing, 93-110 (99.3); tail, 70-83 (75.5); culmen from base, 37-39 (38).

Until the five specimens in the Phelps Collection were obtained, only one had been collected in Margarita; this was obtained by Ferry, for the Chicago Natural History Museum and Cory⁸ comments: "It differs slightly from specimens from Tobago and the mainland in having the under parts more olive and the shaft stripes on the head and breast feathers more tawny. Whether these differences are constant or not remains for future investigators to determine."

For the reasons for considering *susurrans* and *jardinei* as subspecies of *guttatus*, instead of maintaining *susurrans* as a species, with *jardinei* as its subspecies, see Phelps and Phelps, Jr. 1948:192.⁹

SPECIMENS EXAMINED

X. g. guttatus.—BRAZIL: 12.⁷

*X. g. d'orbignyianus*⁷.—BOLIVIA: 17. BRAZIL: 7.

X. g. eytoni.—BRAZIL: 60.⁷

X. g. guttaloides.—BRAZIL: 92⁷. PERU: 62⁷. ECUADOR: 10⁷. COLOMBIA: 2⁷. VENEZUELA: 77⁷. Terr. Amazonas, 21.

X. g. polystictus.—BRITISH GUIANA: 7⁷. DUTCH GUIANA: 2⁷. BRAZIL: 9⁷. VENEZUELA: 3⁷. State of Bolívar, 54; Terr. Amazonas, 21.

X. g. susurrans.—TRINIDAD: 40¹. TOBAGO: 13¹. VENEZUELA: Guanoco, 1 ♂.

X. g. margaritae.—VENEZUELA: Margarita Island, 3 ♂ (incl. type), 1 ♀, 1 (?).

X. g. jardinei.—VENEZUELA: Los Altos, 1 ♂, 1 ♀; Quebrada Bonita, 3 ♂, 1 ♀; Caripe, 1 ♀; Cerro Negro (Caripe), 1 ♂, 5 ♀; Guaraños, 1 ♀; Yaguaraparo, 1 ♂, 1 ♀; Cerro Humo, 2 ♂, 1 ♀, 2 (?); Cerro Azul, 2 ♀.

X. g. demonstratus.—VENEZUELA: Miranda, 7; Guárico, 3; Federal District, 1; Aragua, 8; Carabobo, 12; Yaracuy, 5; Lara, 6; Portuguesa, 2; Barinas, 7; Mérida, 2; Falcón, 4; Táchira, 1; Zulia, 7.

X. g. nanus.—VENEZUELA: Guasdalito, 1 ♂, 1 ♀; La Fría, 1 ♂; La Sabana, Perijá, 1 ♀. COLOMBIA: 10¹. PANAMA (eastern): 10¹.

X. g. marginatus.—PANAMA: 17¹.

X. g. rosenbergi.—COLOMBIA: 7¹.

X. g. costaricensis.—COSTA RICA: 29¹. NICARAGUA: 31.

Dendrocincla fuliginosa barinensis, new subspecies

Type: From Santa Bárbara, State of Barinas, Venezuela; altitude 200 meters. No. 12120, Phelps Collection, Caracas, Venezuela, Adult male collected March 22, 1941, by William H. Phelps. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Nearest to *D. f. meruloides* of the Caracas and Cumaná regions but breast darker, more dusky, less yellowish, and above darker,

⁷For localities see Zimmer, Am. Mus. Nov., No. 756, p. 2, 1934.

⁸The Birds of the Leeward Islands, Caribbean Sea. Field Mus. Nat. Hist., Orn. Ser., 1, No. 5, p. 247, Oct. 1909.

⁹Notas sobre Aves Venezolanas. Bol. Soc. Ven. Cien. Nat., No. 72.

more brownish, less yellowish. Differs from *phaeochroa* by lacking the whitish chin, and by being lighter, more yellowish above.

Range: Known from the upper Apure Valley near the base of the Andes, from Santo Domingo (Táchira) to La Veguita (Barinas) and in Turén (Portuguesa).

Description of types: Top of head and back Brussels Brown; more yellowish on the rump; upper tail-coverts Auburn; sides of head, lores and ear-coverts dusky brown. Chin grayish brown merging into the Snuff Brown of the rest of under parts; under tail-coverts more rufous. Remiges Auburn, paler on under surface, the primaries edged apically, and broadly tipped, with dusky; upper wing-coverts uniform with back; under wing-coverts and axillaries Pinkish Cinnamon. Tail Chestnut, paler on under aspect; shafts of rectrices blackish above, yellowish brown below.

Maxilla (in life) "dark olive"; mandible "olive"; feet "bluish slate". Wing, 103 mm; tail, 84; exposed culmen, 25; culmen from base, 29; tarsus, 24.

Remarks: Sexes alike in color; females slightly smaller. Size similar to *meruloides*. Range of measurements: five adult males—wing, 102-105 (103.2) mm; tail, 78-84 (81.6); culmen from base, 27-30 (28.6); five adult females—wing, 93-97 (95.2); tail, 67-76 (73.2); culmen from base, 25-28 (26.8). Measurements of *meruloides* (from the Sucre-Monagas region): five adult males—wing, 97-103 (100.6); tail, 73-85 (79.6); culmen from base, 29-30 (29.4); five adult females—wing, 91-97 (94.6); tail, 70-82 (77.2); culmen from base, 27-29 (27.8).

The specimens were collected in March and April and have breeding gonads.

SPECIMENS EXAMINED

D. f. fuliginosa.—FRENCH GUIANA: 4¹⁰. DUTCH GUIANA: 2¹⁰. BRITISH GUIANA: 4¹⁰; Kamarang Mt., 1 ♀. BRAZIL: 8¹⁰; Kutu-weik Falls, 1 ♀. VENEZUELA: Altiplanicie de Nuria, 2 ♂, 1 ♀, 1 (?).

D. f. rufo-olivacea.—BRAZIL: 22¹⁰.

*D. f. atirostris*¹⁰.—BRAZIL: 10. BOLIVIA: 5.

D. f. phaeochroa.—VENEZUELA: Cerro Uaipán-tepui, 1 ♂; Cerro Auyan-tepui, 1 ♂; Cerro Chimantá-tepui, 1 ♂, 1 ♀; Caño Pácara, 1 (?); La Paragua, 2 ♂; Raudal Perro, 1 ♀; Cerro Guaiquinima, 1 ♂, 1 ♀; Raudal Capuri, 1 ♂; Cerro Arebuchi, 1 ♂, 1 (?); Cerro Paurai-tepui, 2 ♀, 1 (?); Sabana Kirichú, 1 ♀; Santa Rosalía, 1 ♂, 1 (?); El Cambur, 1 ♂, 1 ♀; Cerro El Negro, 1 ♂; Caño Cataniapo, 2 ♂, 5 ♀, 1 (?); Isla Ratón, 2 ♂, 1 ♀, 1 (?); Caño Cuao, 1 ♂; San Fernando de Atabapo, 2 ♂, 3 ♀, 4 (?); Cerro Yaví, 1 ♂; Las Carmelitas, 1 ♂, 1 ♀; Puerto Yapacana, 1 ♀, 1 (?); San Carlos, Río Negro, 1 ♂.

D. f. barinensis.—VENEZUELA: Santo Domingo, 2 ♂, 3 ♀; Santa Bárbara, Barinas, 2 ♂ (incl. type), 1 ♀; Ciudad Bolívar, 2 ♂, 1 ♀; La Vaguita, 2 ♂; Barinitas, 2 ♂, 2 ♀; Turén, 1 (?).

D. f. meruloides.—VENEZUELA: Cristóbal Colón, 1 ♂; Cerro Humo, 7 ♂; Cerro Azul, 1 ♀; El Pilar, 2 ♀, 1 (?); Tunapuí, 1 (?); Yaguaraparo, 1 ♂, 1 ♀; Caripe, 3 ♀, 1 (?); Quebrada Bonita, 4 ♂, 4 ♀; Cabo Codera, 1 ♀; Aricagua, 1 ♀, 2 (?); Cerro Negro, Miranda, 1 ♂, 1 (?); San José de los Caracas, 1 ♂, 1 ♀; Hda. Altamira, 1 ♂; Cerro Golfo Triste, 2 ♂, 1 ♀, 3 (?); Tacarigua de Mamporal, 2 ♂, 1 ♀; Baruta, 1 ♀; Urama, 2 ♂, 1 ♀; Hda. Santa Clara, 1 ♂; Hda. Panchito,

¹⁰For localities see Zimmer, Am. Mus. Nov., No. 728, p. 19, 1934.

1 ♀; Palma Sola, 1 (♀); Curimagua, 6 ♂, 4 ♀; Cerro El Cogollal 1 (♀).
D. f. lafresnayi.—VENEZUELA: La Sabana, Perijá, 2 ♂; La Sierra, 2 ♂, 1 ♀, 1 (♀); El Vigía, 2 ♂; Seboruco, 3 ♂; Santa Cruz de Mora, 1 ♂.

*D. f. ridgwayi*¹⁰.—ECUADOR: 17. COLOMBIA: 4. PANAMA: 12. COSTA RICA: 6.

***Philydor rufus cuchiverus*, new subspecies**

Type: From Cerro El Negro, upper Cuchivero River, State of Bolívar, Venezuela; altitude 1000 meters. No. 42400, Phelps Collection, Caracas, Venezuela. Adult male collected November 24, 1947, by Manuel Castro. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Nearest to *P. r. columbianus* and *P. r. panerythrus* but the breast is more ochraceous without any olivaceous shading; forehead, crown and back darker, more dusky, less yellowish.

Range: Known only from Cerro El Negro, in the lower Subtropical Zone at the altitude of 1000 meters.

Description of Type: Top of head Olive-Brown with pale inconspicuous shaft streaks, more Ochraceous-Tawny on forehead; back and uropygium Snuff Brown; lores dusky ochraceous; superciliary stripe and gular region Yellow Ocher uniform with breast; post-ocular streak Olive-Brown. Throat, breast and upper abdomen Yellow Ocher merging into the Dresden Brown of flanks, lower abdomen, thighs and under tail-coverts. Remiges Tawny, paler below, apical portions Fuscous; inner tertials brownish olive; greater upper wing-coverts brownish olive, median ones Tawny, lesser ones more olivaceous; under wing-coverts and axillaries Ochraceous-Tawny. Tail Tawny, paler below, the inner rectrices, and outer vanes of the two following pairs, brownish olive; shafts of rectrices brown above, whitish below.

Bill (in life) "black, base grayish black"; feet "grayish yellow"; iris, "brown". Wing, 95 mm; tail, 85; exposed culmen, 18; culmen from base, 23; tarsus, 25.

Remarks: Size similar to *columbianus*. Range of measurements: two adult males (incl. type)—wing, 94, 95 (94.5); tail, 83, 85 (84); culmen from base, 23, 23 (23). Measurements of *columbianus*: Two adult males (incl. type)—wing, 92, 95 (93.5); tail (1), 84; culmen from base, 22, 22 (22); three adult females—wing, 76-89 (83.3); tail, 79-82 (80); culmen from base, 21-22 (21.3). Measurements of *panerythrus*: two adult males—wing, 99, 100 (99.5); tail (1), 84; culmen from base, 21, 21 (21); one adult female—wing, 95; tail, 86; culmen from base, 21; two specimens of undetermined sex—wing, 99, 104 (101.5); tail, 86, 99 (90.2); culmen from base, 22, 22 (22).

The locality of the proposed new subspecies constitutes an extension of the range of the species from the north coast of Venezuela, Colombia and from Brazil, south of the Amazon.

SPECIMENS EXAMINED

*P. r. panerythrus*¹.—COSTA RICA: Navarro, 1 ♀; La Estrella, 1 ♂; Navarrito, 1 ♂; Chiriquí, 1 (♀); Boquete, 1 (♀).

P. r. columbianus.—VENEZUELA: Cumbre de Valencia, 1 ♀¹; Hda Santa Clara, 1 ♂, 1 ♀; Silla de Caracas, 1 ♂¹; Hda. Izcaragua, 1 ♀.

P. r. cuchiverus.—VENEZUELA: Cerro El Negro, 2 ♂ (incl. type).

*P. r. riveti*¹.—COLOMBIA: Arenosas, Antioquia, 1 ♂. ECUADOR: Mindó, 1 ♂; La Gualera, 1 ♂; Pichincha, 1 ♂.

*P. r. bolivianus*¹.—PERU: Río Seco, 1 ♂, 1 ♀. BOLIVIA: Vermejo, 3 ♂, 1 ♀.

*P. r. chapadensis*¹.—BRAZIL: Chapada, 9 ♂, 6 ♀.

*P. r. rufus*¹.—BRAZIL: San Sebastian, 2 ♂; Monte Serrat, 2 ♀; 'Rio', 1 (?); Roca Nova, 1 ♂, 1 ♀; Faz. Esperança, 1 ♂, 1 ♀; Faz. Cayoa, 1 ♂, 1 ♀; Ponte Maromba, 1 ♂; Alta de Serra, 1 ♂. ARGENTINA: Iguazú, 1 ♂, 1 ♀.

***Knipolegus poecilurus paraquensis*, new subspecies**

Type: From Cerro Paraque, Terr. Amazonas, Venezuela; altitude 1600 meters. No. 33729, Phelps Collection, Caracas, Venezuela. Adult male collected February 15, 1946, by William H. Phelps, Jr. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Differs from all other subspecies of *poecilurus* by the total absence of any rufous on the rectrices.

Range: Known only from the type specimen from Cerro Paraque in the Subtropical Zone at the altitude of 1600 meters.

Description of Type: Top of head and back Hair Brown X Chaetura Drab, the rump slightly paler and upper tail-coverts with dusky centers; dusky centers to the feathers of crown and forehead giving a spotted appearance; sides of head slightly more brownish. Throat, breast, sides and thighs Deep Grayish Olive, merging into the Pale Ochraceous-Buff of abdomen, the throat mixed with pale buffy; under tail-coverts Ochraceous-Buff. Wings Blackish Brown, the outer vanes of remiges very narrowly edged with grayish, except the outermost, most prominently on the tertials; the inner vanes edged with very pale buffy, progressively more extensively towards the innermost; upper wing-coverts broadly edged with grayish giving a mottled rather than banded appearance; axillaries and under wing-coverts Light Ochraceous-Salmon X Ochraceous-Salmon. Upper surface of tail Blackish Brown, narrowly and faintly barred with blackish, the outer rectrices very narrowly edged outwardly and apically with whitish and all the rectrices, except the central ones, inwardly and narrowly edged with whitish; lower aspect of tail paler.

Bill (in life) "brownish black"; feet "brownish black"; iris "red". Wing, 75 mm; tail, 63; exposed culmen, 11; culmen from base, 15; tarsus, 17.

Remarks: Size similar to *K. p. salvini*. Range of measurements: one adult male (type)—wing, 75 mm; tail, 63; culmen from base, 15. *K. p. salvini*: four adult males—wing, 75-81 (77.7); tail, 62-70 (66.5); culmen from base, 15-17 (16); four adult females—wing, 70-73 (71.2); tail, 58-62 (60.1); culmen from base, 15-17 (16.2). *K. p. venezuelanus*: one adult male—wing, 74; tail, 63; culmen from base, 16; one adult female—wing, 72; tail, 61; culmen from base, 15.

The type is in fresh plumage comparable with two specimens from Mt. Duida in the American Museum of Natural History and with two from Mts. Chimantá-tepui and Yapacana in the Phelps Collection; *paraquensis* is less whitish on the throat and breast.

SPECIMENS EXAMINED

K. p. poecilurus.—COLOMBIA¹: La Palma, Huila, 1 ♂, 1 ♀; La Candela, 1 ♂; San Agustín, 1 ♂; San Antonio, W. Col., 1 ♂; Santa Elena, Antioquia, 1 ♀.

K. p. venezuelanus.—VENEZUELA: Queniquea, Táchira, 1 ♂, 1 ♀.

K. p. salvini.—VENEZUELA: Cerro Roraima¹, 5 ♂, 2 ♀; Cerro Uei-tepui, 2 ♂; Cerro Sororopán-tepui, 1 ♂, 2 ♀; Cerro Chimantá-tepui, 3 ♂, 1 ♀; Cerro Murú, 1 (♀); Cerro Acopán-tepui, 1 ♂, 1 (♀); Cerro Sarisariñama, 2 (♀); Cerro Yapacana, 1 ♀, 1 (♀); Cerro Duida¹, 2 ♂.

K. p. paraquensis.—VENEZUELA: Cerro Paraque, 1 ♂ (type).

*K. p. peruanus*¹.—PERU: Lomo Santo, 1 ♂, 1 ♀; Nuevo Loreto, 1 ♂, 1 (♀); Chaupé, 5 ♂, 1 ♀; Utcuyacu, 2 ♂, 2 ♀. ECUADOR: Zamora, 2 ♂, 1 ♀; Guayaba, 1 ♂, 1 ♀; Sabanilla, 1 ♀.

Troglodytes rufulus yavii, new subspecies

Type: From Cerro Yaví, La Cumbre, Terr. Amazonas, Venezuela; altitude 2250 meters. No. 37787, Phelps Collection, Caracas, Venezuela. Adult male collected March 3, 1947, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Nearest to *T. r. duidae* from Mts. Duida and Paraque but under tail-coverts paler, more yellowish.

Range: Known only from Mts. Yaví and Sarisariñama in the Subtropical Zone at altitudes between 1800 and 2250 meters.

Description of Type: Top of head, back and uropygium Hazel X Auburn; lores dusky, tipped with grayish; prominent superciliary stripe extending from eye to neck pale buffy; wide post-ocular streak uniform with crown; ear-coverts buffy brown. Chin, throat and breast Pale Smoke Gray, whiter on abdomen; sides washed with olive brown; flanks Argus Brown, thighs more dusky; under tail-coverts Ochraceous-Tawny, narrowly barred with dusky. Wings Fuscous; outer vanes of two outer remiges narrowly edged with whitish; rest of remiges more broadly banded with pale brown on outer edges, basally; upper wing-coverts broadly edged with Hazel; bend of wing and axillaries whitish; under wing-coverts white mixed with dusky. Rectrices buffy, narrowly barred with dusky, the outer ones paler.

Bill (in life) "black, base flesh"; feet "brownish black"; iris "brown". Wing, 53 mm; tail, 37; exposed culmen, 13; culmen from base, 18; tarsus, 23.

Remarks: Sexes alike. Wings shorter than *T. r. duidae*. Range of measurements: five adult males—wing, 53-53 (53) mm; tail, 37-38 (37.6); culmen from base, 16-18 (16.8); five adult females—wing, 50-53 (51); tail, 34-36 (35.4); culmen from base, 16-17 (16.2). *T. r. duidae*:¹¹ five males—wing, 55-59; tail, 37-41; culmen, 17-17.5; five females—wing, 54-47; tail, 37-38; culmen, 16-17.

Description of juvenile (No. 19732): upper parts Auburn, the crown, wings and tail barred with dusky; superciliary stripe as in adult; sides of head mottled buffy and dusky. Chin, throat, breast and abdomen whitish, barred or scalloped with dusky; sides tinged with pale brownish; vent buffy; under tail-coverts Argus Brown; axillaries and under wing-coverts mixed grayish and dusky.

SPECIMENS EXAMINED

T. r. rufulus.—VENEZUELA: Cerro Roraima, 5 ♂, 5 ♀; Cerro Uei-tepui, 5 ♂, 3 ♀, 2 (♀); Cerro Aprada-tepui, 2 ♂, 2 ♀; Cerro Chimantá-tepui, 3 ♂, 3 ♀, 1 (♀).

¹¹Chapman, Am. Mus. Nov., No. 380, p. 22, 1929.

T. r. duidae.—VENEZUELA: Cerro Duida, 1 ♂, 1 ♀, 37¹; Cerro Paraque, 14 ♂, 6 ♀, 6 (?).

T. r. yavii.—VENEZUELA: Cerro Sarisariñama, 1 ♂, 1 (?) juv.; Cerro Yaví, 8 ♂ (incl. type), 4 ♀, 3 (?).

T. r. fulvicularis.—VENEZUELA: Cerro Auyan-tepui, 2 ♂; Cerro Ptari-tepui, 4 ♂, 7 ♀, 1 (?); Cerro Sororopán-tepui, 2 ♂, 2 ♀, 1 (?).

***Conirostrum speciosum guaricola*, new subspecies**

Type: From El Socorro, State of Guárico, Venezuela; altitude 80 meters. No. 40231, Phelps Collection, Caracas, Venezuela. Adult male collected June 25, 1947, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis: The male differs from *C. s. amazonum* in being paler above, light instead of dark blue, in this being similar to *C. s. speciosum*. Differs from *speciosum* in being darker below, more bluish gray. The female differs from *amazonum* in having the under tail-coverts pale yellowish instead of salmon or dark buffy; differs from *speciosum* in having a darker blue crown and more greenish, less yellowish, back; the under tail-coverts are pale yellowish instead of whitish.

Range: Known only from the Llanos in east central Guárico and central Anzoátegui near the Guárico border.

Description of Type: Top and sides of head and back near to Delft Blue, merging into the Parula Blue of rump and upper tail-coverts. Chin, throat, breast and sides Pale Medici Blue X Glaucous Gray, merging into the whitish abdomen; under tail-coverts Amber Brown. Wings Fuscous; remiges narrowly edged, outwardly, with Parula Blue, more broadly on tertials; primary coverts Fuscous; rest of upper wing-coverts edged with Parula Blue; a prominent white speculum exposed for 5 mm; under wing-coverts whitish and dusky; axillaries white. Tail Fuscous, paler below, the rectrices edged with Parula Blue.

Bill (in life) "black, base grayish blue"; feet "grayish blue"; iris "dark". Wing, 56 mm; tail, 37; exposed culmen, 10; culmen from base, 12; tarsus, 14.

Remarks: Sexes different in color. Range of measurements: four adult males—wing, 56-60 (57.5) mm; tail, 37-42 (39.6); culmen from base, 12-13 (12.2). Measurements of one adult male *amazonum* (from Puerto Páez, Venezuela)—wing, 58; tail, 40; culmen from base, 12.

Description of female: Top of head Parula Blue, slightly mixed with dusky; back, rump and upper tail-coverts Oil Yellow X Yellowish Oil Green; lores and sides of head pale buffy. Chin, throat and breast pale buffy; sides more greenish; abdomen whitish; thighs dusky; under tail-coverts pale buffy. Wings Fuscous; remiges edged externally uniformly with the back and internally with whitish; under wing-coverts whitish and dusky; axillaries whitish. Tail Fuscous, paler on under surface, the rectrices broadly edged externally uniformly with the back.

The speculum in the male varies in exposure. On the type it is exposed only on one wing; on two specimens it is not exposed at all and on another only on one wing.

A specimen from Puerto Páez, in the Phelps Collection, and those from Frechal and "Bogotá" in the American Museum of Natural History are intermediates and should be referred at present to *amazonum*.

Regarding the Frechal and "Bogotá" specimens Dr. Zimmer¹² says: "It appears probable that there may be a separable form on the Surumú and in the Guianas (whence I have no material)—. I hesitate, therefore to propose a formal separation until a good series from the critical region is available for study. The allocation of east-Colombian birds will then be open for further examination."

SPECIMENS EXAMINED

C. s. speciosum.¹—PARAGUAY: Sapucay, 1 ♂, 1 ♀; Trinidad, 1 ♀; Fort Wheeler, 1 ♀; Candamo, 1 ♂. BOLIVIA: Río Cachimayo, 1 ♂. BRAZIL: Urucum, Matto Grosso, 5 ♂, 1 ♀; Chapada, 5 ♂, 1 ♀; Río San Lorenzo, 2 ♂; Corumba, 2 ♂; "Para", 1 ♂; "Bahia", 1 ♂; "Brazil", 2 ♂.

C. s. amazonum.—PERU: Upper Río Ucayale, 1 ♂¹. ECUADOR: Río Suno Abajo, 1 ♂¹. BRAZIL¹: Rosarinho, Rio Madeira, 1 ♂; Faro, 3 ♂; Villa Bella Imperatriz, 1 ♀; Frechal, Río Surumú, 3 ♂, 1 ♂ juv., 1 ♀. COLOMBIA¹: "Bogotá", 2 (?). VENEZUELA: Puerto Páez, Apure, 1 ♂.

C. s. guaricola.—VENEZUELA: El Socorro, 1 ♂ (type); Santa María de Ipire, 1 ♂, 1 ♀, 1 (?); Pariaguán, 1 ♂.

Atlapetes brunnei-nucha allinornatus, new subspecies

Type: From San Luis, State of Falcón, Venezuela; altitude 1360 meters. No. 5948, Phelps Collection, Caracas, Venezuela. Adult male collected March 29, 1940, by Ventura Barnés, Jr. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Nearest to *A. b. inornatus* of western Ecuador from which it differs in size only, the wings and tail being longer; differs from *xanthogenys* of the Caracas region and from *brunnei-nucha* of the Mérida region, and México to Perú, by lacking the pectoral band.

Range: The San Luis mountains of Falcón and Bucaral, Yaracuy, in the Subtropical Zone at altitudes from 1300-1360 meters.

Description of Type: Forehead and sides of head black, the former with three prominent white spots; crown darker than Amber Brown; back and uropygium Pyrite Yellow X Warbler Green; below white, the hidden basal part of the feathers, except the throat, dusky; sides and forebreast grayish and dusky; rest of sides, flanks and thighs uniform with back; under tail-coverts olivaceous with buffy bars. Wings Benzo Brown, remiges and upper wing-coverts edged with green uniform with back; bend of wing Amber Yellow; under wing-coverts olivaceous and dusky. Tail Benzo Brown with very faint narrow dusky bands, paler below; outer vanes tinted with olivaceous, especially basally.

Bill (in life) "black"; feet "blackish"; iris "brown"; Wing, 82 mm; tail, 80; exposed culmen, 16; culmen from base, 18; tarsus, 30.

Remarks: Sexes alike. Range of measurements: two adult males (incl. type)—wing, 81, 82 (81.5); tail, 80, 82 (81); culmen from base, 18, 20 (19); one adult female—wing, 80; tail, 81; culmen from base, 19. *A. b. inornatus* (from western Ecuador): one adult male—wing, 75; tail, 70; culmen from base, 19; two adult females—wing, 75, 77 (76); tail, 65, 65 (65); culmen from base, 18, 18.5 (18.2). *Allinornatus* has a 7% longer wing and 11% longer tail than *inornatus*.

¹²Mutation among Birds in the Genus Buarremon. Bull. Am. Mus. Nat. Hist., 48, Art. 9, pp. 244, 1923.

It is interesting that the two subspecies without pectoral bands are found so far apart (western Ecuador and northern Venezuela), their ranges being separated by the pectoral banded *brunnei-nucha* and *xanthogenys*. Chapman¹³ studies the causes of the presence or absence of the black pectoral band in this species and says: "It is this black collar which is the principal mutant character and which, as I shall attempt to show, appears or disappears purely as an individual variation and without relation to external influences. Its perpetuation or establishment as a specific mark does, however, depend upon environment expressed in what is doubtless the most important external agent in promoting evolution—that is, isolation."

There is a specimen in the American Museum of Natural History labelled: "*A. b. brunneinucha*, 520453. Pet Grove (Petit Goave), 32 miles west of Port au Prince, Hayti, July, 1885. C. F. Navell. ♂". We can find no published records for the species from the West Indies, so the above label may be in error. Regarding this specimen, James Bond, of the Academy of Natural Sciences of Philadelphia, examined the specimen and writes: "In our opinion there can be no doubt that the individual was a cage-bird, possibly one that had escaped confinement. I have numerous records of this sort from various West Indian islands, . . .".

SPECIMENS EXAMINED

A. b. inornatus.—ECUADOR¹: Los Llanos, 1 ♂; Coco, Río Chimbo (2800 ft.), 2 ♀; Pallatanga (5000 ft.), 1 ♀ juv.

A. b. brunnei-nucha.—MEXICO¹: 7. GUATEMALA¹: 14. NICARAGUA¹: 22; COSTA RICA¹: 19. PANAMA¹: 38. COLOMBIA¹: 64. ECUADOR¹: 46. VENEZUELA: Villa Páez, Páramo de Tamá, 1 (?); Páramo Zumbador, 1 ♂, 1 ♀; Queniquea, 1 ♂, 1 ♀; Boca de Monte, 3 ♂, 1 ♀, 4 (?); El Valle, Mérida, 1 ♂, 1 ♀; Páramo de Misísí, 2 ♂; Cerro Niquitaz, 1 ♂, 1 ♀.

A. b. xanthogenys.—VENEZUELA: Cubiro, 2 ♂, 1 ♀, 1 ♀ juv., 1 (?); Cumbre de Valencia, 1 ♂; Colonia Tovar, 6 ♂, 2 ♀; El Junquito, 6 ♂, 2 ♀, 3 (?); Cerro El Avila, 1 ♂, 2 ♀; No León, 1 ♂, 1 (?); Hda. Santa Clara, 2 ♂; Izcaragua, 1 ♂, 2 ♀; Cerro Negro, Miranda, 1 ♀.

A. b. allinornatus.—VENEZUELA: San Luis, 1 ♂ (type), 1 ♂ juv., 1 ♀; Bucaral, Yaracuy, 1 ♂.

Atlapetes torquatus larensis, new subspecies

Type: From Cerro El Cogollal, Quebrada Arriba, State of Lara, Venezuela; altitude 1400 meters. No. 18792, Phelps Collection, Caracas, Venezuela. Adult male collected June 24, 1942, by Fulvio Benedetti. (Type on deposit at the American Museum of Natural History.)

Diagnosis: Nearest to *A. t. perijanus*, from the Perijá Mountains, Zulia, from which it differs in having darker flanks and under tail-coverts, brownish olive instead of yellowish olive. Differs from *phaeopleurus* of the Caracas region in having gray superciliary stripes instead of white.

Range: Known from the mountains in the northeastern corner of Lara and eastern Táchira, in the Subtropical Zone at altitudes between 1300 and 1800 meters.

Description of Type: Head, except throat, black with wide gray crown and superciliary stripes, the latter narrower and whiter anteriorly; back

and uropygium Old Gold X Orange-Citrine; sides of neck gray. Chin, throat and center of breast and abdomen white; prominent black pectoral band; sides gray merging into olivaceous flanks and thighs, the under tail-coverts browner. Wings Benzo Brown, very indistinct dusky bars on tertials; outer vanes of remiges heavily edged with yellowish green, uniform with back; bend of wing Lemon Chrome; under wing-coverts and axillaries grayish and olivaceous. Tail Benzo Brown with indistinct dusky bars on median rectrices; outer vanes heavily tinted with olivaceous, darker than the back; under aspect of tail paler.

Bill (in life) "black"; feet "brown"; iris "brown". Wing, 80 mm; tail, 77; exposed culmen, 18; culmen from base, 21; tarsus, 29.

Remarks: Sexes alike. Size similar to *A. t. perijanus*. Range of measurements: six adult males—wing, 79-85 (81.3) mm; tail, 77-82 (79); culmen from base, 19-21 (20.1); one adult female—wing, 83; tail, 83; culmen from base, 21. *A. t. perijanus*: two adult males—wing, 84, 84 (84); tail, 79, 81 (80); culmen from base, 21, 22 (21.5); four adult females—wing, 74-85 (80); tail, 70-81 (77); culmen from base, 20-22 (21); two adults of undetermined sex—wing, 75, 85 (80); tail, 73, 79 (76); culmen from base, 21, 22 (21.5).

The range of *larensis* (Lara and Táchira) is interrupted by *assimilis* which is known in Venezuela only by two specimens from the State of Mérida (Páramo de La Culata) according to Hellmayr¹⁴. Neither is the range of *assimilis* continuous since it jumps from Colombia over our Táchira specimens of *larensis* to the Páramo de La Culata. This distribution is similar to that of the species *A. brunnei-nucha* in which the subspecies *inornatus* from western Ecuador, without pectoral band, jumps over the intervening range of *brunnei-nucha* to the State of Falcón, in northwestern Venezuela where it changes to *allinornatus*, a race differing from it only in size.

SPECIMENS EXAMINED

A. t. assimilis.—COLOMBIA: El Piñon, 1 ♂¹; Santa Isabel, 1 ♀³; Laguneta, Cauca, 1 ♂¹.

A. t. basilicus.—COLOMBIA¹: Valparaíso, Santa Marta, 1 ♂; El Líbano, 1 ♀.

A. t. perijanus.—VENEZUELA: La Sabana, Zulía, 2 ♂, 4 ♀, 2 (?).

A. t. larensis.—VENEZUELA: Cerro El Cogollal, Lara, 2 ♂ (incl. type); Cerro El Cerrón, 3 ♂; Queniquea, Táchira, 1 ♂; Seboruco, 1 ♀.

A. t. phaeopleurus.—VENEZUELA: Silla de Caracas, 1 ♂¹; Curupao, 1 ♂; Cerro Golfo Triste, 1 ♂, 1 ♀, 1 (?).

A. t. phygas.—VENEZUELA: Quebrada Bonita, 1 (?); Cerro El Peonía, 1 ♂; Los Palmales¹, 1 ♂, 1 ♀; Cerro Negro (Monagas), 5 ♂, 4 ♀, 2 (2) juv.; Caripe, 1 ♂; Cerro Humo, 10 ♂, 4 ♀, 1 (?), 1 (?) juv.

¹⁴Bds. Americas, etc., Pt. XI, p. 418 (footnote).



EXPLANATION OF PLATE

- | | |
|------------------------------|---------------------------|
| 106 Acopán-tepui, Cerro | 55 Caripe |
| 70 Altigracia (Upata) | 61 Carúpano |
| 37 Altamira, Hda. (Carabobo) | 25 Casigua |
| 74 Altiplanicie de Nuria | 86 Cataniapo, Caño |
| 103 Aprada-tepui, Cerro | 104 Chimantá-tepui, Cerro |
| 105 Arebuchi, Cerro | 15 Ciudad Bolivia |
| 49 Aricagua | 58 Coche, Isla de |
| 24 Aurare, Río | 1 Cojoro |
| 99 Auyan-tepui, Cerro | 42 Colonia Tovar |
| 66 Azul, Cerro | 66 Cristóbal Colón |
| 52 Barcelona | 88 Cuao, Caño |
| 16 Barinitas | 21 Cubiro |
| 22 Barquisimeto | 14 Culata, Páramo de la |
| 44 Baruta | 56 Cumaná |
| 7 Boca de Monte | 31 Cumarebo |
| 33 Bucaral | 39 Cumbre de Valencia |
| 82 Cambur (El Cambur) | 30 Curimagua |
| 49 Codera, Cabo | 45 Curupao |
| 98 Capuri, Raudal | 26 Dabajuro |
| 57 Cariaco, Golfo de | 93 Duida, Cerro |

- 44 El Avila, Cerro
- 60 El Cafetal (Margarita)
- 23 El Cerrón, Cerro
- 23 El Cogollal, Cerro
- 76 El Dorado
- 43 El Junquito
- 84 El Negro, Cerro
- 71 El Palmar
- 53 El Peonía, Cerro
- 73 El Perú Mine (Bolívar)
- 62 El Pilar
- 67 El Socorro
- 20 El Tocuyo
- 13 El Valle (Mérida)
- 5 El Vigía
- 24 Empalado Sabana
- 46 Golfo Triste, Cerro
- 79 Guaiquinima, Cerro
- 64 Guanoco
- 62 Guaraúnos
- 10 Guasqualito
- 65 Humo, Cerro
- 44 Izcaragua, Hda. (Miranda)
- 96 Kirichú, Sabana
- 13 La Azulita
- 4 La Fria
- 77 La Paragua
- 81 La Prisión
- 2 La Sabana
- 2 La Sierra
- 81 La Unión
- 17 La Veguita
- 33 Lagunita de Aroa
- 57 Laguna Grande del Obispo
- 94 Las Carmelitas
- 110 Los Altos
- 54 Los Palmales
- 44 Macuto
- 111 Manoa
- 38 Maracay
- 59 Margarita, Isla de
- 18 Misisí, Páramo de
- 28 Moruy
- 107 Murú, Cerro
- 55 Negro, Cerro (Monagas)
- 47 Negro, Cerro (Miranda)
- 19 Niquitaz, Cerro
- 43 No León
- 102 Pácara, Caño
- 32 Palma Sola
- 34 Panchito, Hda. (Yaracuy)
- 89 Paraque, Cerro
- 69 Pariaguan
- 97 Paurai-tepui, Cerro
- 78 Perro, Raudal
- 51 Píritu
- 100 Ptari-tepui
- 60 Porlamar
- 52 Puerto de la Cruz (Anzoátegui)
- 42 Puerto de la Cruz (Dist. Fed.)
- 40 Puerto Cabello
- 85 Puerto Páez
- 23 Quebrada Arriba
- 53 Quebrada Bonita
- 8 Queniquea
- 87 Ratón, Isla
- 108 Roraima, Cerro
- 29 Sabaneta
- 57 San Antonio del Golfo
- 92 San Carlos (Río Negro)
- 90 San Fernando de Atabapo
- 45 San José de Los Caracas
- 30 San Luis
- 28 Santa Ana, Cerro
- 11 Santa Bárbara (Barinas)
- 41 Santa Clara, Hda. (Aragua)
- 12 Santa Cruz de Mora
- 68 Santa María de Ipire
- 83 Santa Rosalía (Bolívar)
- 9 Santo Domingo
- 95 Sarisariñama, Cerro
- 6 Seboruco
- 44 Silla de Caracas
- 100 Sororopán-tepui, Cerro
- 80 Suapure
- 48 Tacarigua de Mamporal
- 3 Tamá, Páramo de
- 77 Tigre, Cerro
- 72 Tomasote, Cerro
- 50 Tortuga, Isla
- 62 Tunapuí
- 36 Turén
- 41 Turiamo
- 101 Uaipán-tepui, Cerro
- 109 Uei-tepui, Cerro
- 35 Urama
- 27 Urumaco
- 3 Villa Páez
- 63 Yaguaraparo
- 75 Yuruán, Río
- 91 Yapacana, Cerro
- 91 Yapacana, Puerto
- Yavi, Cerro. 75 ks. south of 84
- 8 Zumbador, Páramo

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

SOME WESTERN MILLIPEDS OF THE FAMILY
CHELODESMIDAE

BY RALPH V. CHAMBERLIN

The notes and diagnoses recorded in the present paper are based upon material in the author's collection at the University of Utah where the types of the new forms are for the present retained.

Genus CHONAPHE Cook, 1904

Orthotype: *Chonaphe armata* (Harger)

The type species has been the only one heretofore known for *Chonaphe* as here restricted by removal of *Chonaphe elrodi* Chamberlin to a new genus. Three new species are here added.

Chonaphe armata (Harger)

Polydesmus armatus Harger, 1872, Amer. Jour. Sci. and Arts, 4:120.

Chonaphe armata Cook, 1904. Harriman Alaska Exped., 8(1):56;
*2a-2c ?—*Polydesmus erucus* Wood, 1865, Trans. Amer. Phil. Soc., 13:27
? *Chonaphe eruca* Cook, 1904, Harriman Alaska Exped., 8(1):57.

Type locality: Oregon.

The form illustrated by Cook may be accepted as the true *armata*. Since *eruca* Wood was based upon a female only, it is doubtful whether it can ever be identified with certainty even as to its genus in the absence of any type specimen.

Chonaphe cygnea new Species

Fig. 1

Dorsum approximately chestnut in color, with the keels yellow. Legs light brown, the distal articles darkest. Antennae brown.

From *remissa* differing in the general outline of the anterior lamina of the gonopods, in the details of the distal end of that lamina, and in the much larger lamina or fold on the anterior face. See further fig. 1.

Width, 4.7 mm.

Type locality: Washington: White Swan. One male taken May 7, 1933, by Wm. W. Baker.

This is a notably smaller form than *C. patriotica*.



PLATE VIII

Chonaphe patriotica new species

Figs. 2 and 3

Prozonites chestnut above; metazonites chestnut to black, the keels in preserved specimens yellow. Legs and antennae dark brown to chestnut.

The gonopods are of the same general structure as in *armata* but differ in details, especially those of the terminal portion of the anterior lamina as shown in figs. 2 and 3.

Length, about 32 mm.; width, up to 6.5 mm.

Type locality: Idaho: Fourth of July Canyon. Males and females taken Aug. 12, 1929, by Edith S. and R. V. Chamberlin.

Chonaphe remissa new species

Figs. 4 and 5

Dorsum dark chestnut, in part blackish; keels yellow, probably faded from orange, excepting the anterior and posterior borders which are dark, the dark band of posterior border narrow. Legs lighter chestnut, the antennae somewhat darker.

A smaller form than *C. patriotica* from which it differs also in the details of the gonopods, especially those of the anterior lamella, as, e.g., form and small size of the lobe on its anterior face. The general outline of the anterior branch is also obviously different from that of *patriotica* and *armata*. See further figs. 4 and 5.

Width, 5.3 mm.

Type locality: Washington: Puyallup. Male holotype taken by Wm. W. Baker.

Genus **MONTAPHE** new

Related to *Chonaphe* in having the gonopods much longer and more exposed than in *Harpaphe*. Differing from *Chonaphe* in having the anterior branch of the gonopods slender and bearing short, uncate processes distally, instead of being conspicuously laminate-cristate.

Orthotype: *Montaphe elrodi* (Chamberlin).

Montaphe elrodi (Chamberlin)

Leptodesmus (Chonaphe) elrodi Chamberlin, 1913, Canad. Entomologist, p. 24; *17.

Type locality: Montana: Flathead Lake.

Genus **HARPAPHE** Cook, 1904

Orthotype: *Harpaphe haydeniana* (Wood).

Harpaphe haydeniana (Wood)

Leptodesmus haydenianus Wood, 1864, Proc. Acad. Sci. Phil., p. 10; 1865, Trans. Amer. Phil. Soc., 13:226.

Harpaphe haydenianus Cook, 1904, Harriman Alaska Exped., 8(1):59; *3:4a-4c.

Type locality: Oregon.

Other records: Oregon: North fork of Alsea River; Laturell Falls,

Aug. 4, 1929 (Chamberlin coll.); Boyer, Sept. 23, 1937 (J. A. Macnab coll.); Rosy Creek, Pistol River, Aug. 3, 1945 (Ned Chapman coll.). Washington: Quinalt Lake; Issaquah, Aug., 1929 (Chamberlin). British Columbia: Cameron, Sept. 13, 1935 (Chamberlin coll.); Steelhead, 1933 (H. Leach); White Cliff; Metlakatla.

***Harpaphe clara* new species**

Figs. 6, 7

Dorsum at present dark brown or chocolate colored, with the keels yellow. Legs light brown.

The posterior blade of the gonopods more strongly curved beyond its middle than in the closely related *H. intaminata*, with the upper, or inner, margin more concave; anterior hook relatively narrower, with the apical portion more slenderly prolonged; median process with distal margin nearly straight instead of convex. See further figs. 6 and 7.

Width, 6.2 mm.

Type locality: California: Santa Clara Co., Stevens Creek. Male holotype taken Apr. 23, 1921, in a rotten log.

Other record: California: Santa Cruz Co., Santa Cruz.

***Harpaphe inlignea* new species**

Fig. 8

The color of the type has faded from long preservation. At present the keels are the usual yellowish color and the dorsum elsewhere a light, in part somewhat pinkish, brown.

The posterior blade of the gonopods moderately short, not distally acuminate, the end being blunt or notched as shown in fig. 8. The middle process with distal margin highest at anterior end as shown in the figure.

Width, 6 mm.

Type locality: California: Inwood. One male.

***Harpaphe penulta* new species**

Fig. 9

When in full color the dorsum is black, with the keels orange color, but these colors fade in alcohol. Legs and antennae dark brown or chocolate colored.

In contrast with the distal margin of the median hook of the gonopods in, e.g., *haydeniana*, that of the present species, instead of being convex, is truncate or, more commonly, concave as shown in the figure, which see for the other features. (Fig. 9.)

Length, about 32 mm.; width, 5.8 mm.

Type locality: Oregon: 9 miles south of Belnap Springs. Males and females taken July 14, 1946, by S. and D. Mulaik.

Other records: Oregon: McKenzie Bridge, males and females, July 14, 1946 (S. and D. Mulaik); two miles west of Blue River, July 13,

1946 (S. and D. Mulaik), males and females; Lane County, near Vida, June 28, 1941.

Harpaphe pottera new species

Fig. 10

General coloration similar to that of related species. The dorsum chocolate brown or mahogany colored, with the keels lemon yellow and the prozonites often contrasting in being lighter colored than the metazonites. Legs brown, and the antennae more chestnut.

Most readily distinguished by the peculiarities of the gonopods, in particular by those of the principal blade which is shorter and less curved than usual and has the distal margin evenly convex. See further fig. 10.

Length, about 45 mm.; Width, 7 mm.

Type locality: California: Potter Creek. Males, females and young individuals taken July 15, 1937, by R. V. Chamberlin.

Harpaphe telodonta Chamberlin

Fig. 11

Paimokia telodonta Chamberlin, 1945, Bull. Univ. Utah, Biol ser., 8(2):17*33.

Type locality: California: Humboldt County: Arcata.

Other records: California: 4 miles south of Requa, on the Crescent City road; Prairie Creek Park, Red Wood Fork.

EXPLANATION OF FIGURES

1. *Chonaphe cygneia* n. sp. Left gonopod, anterior view.
2. *Chonaphe patriotica* n. sp. Right gonopod, ectocaudal view.
3. *Chonaphe patriotica* n. sp. Right gonopod, submedian view.
4. *Chonaphe remissa*, n. sp. Right gonopod, subposterior view.
5. *Chonaphe remissa* n. sp. Right gonopod, subanterior view.
6. *Harpaphe clara* n. sp. Telopodite of left gonopod, anterior view.
7. *Harpaphe clara* n. sp. Telopodite of left gonopod, submesal view.
8. *Harpaphe inlignea* n. sp. Right gonopod, mesal view.
9. *Harpaphe penulta* n. sp. Left gonopod, mesal view.
10. *Harpaphe pottera* n. sp. Right gonopod, anterior view.
11. *Harpaphe telodonta* (Chamberlin). Right gonopod, anterior view.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

CAVIES OF SOUTHERN PERU

BY COLIN CAMPBELL SANBORN

The first Peruvian cavy to be named was *Cavia tschudii* Fitzinger 1867 based on *Cavia cutleri* Tschudi 1845 from Ica, Department Ica, Peru. The Peruvian Zoological Expedition 1941-42, of the Chicago Natural History Museum, collected a series of five topotypes of *C. t. tschudii*. These are brown above, heavily mixed with black; below light gray or buffy gray; collar on throat like sides but lighter; face and nose lighter than back; hind feet dark gray or brownish.

A series of twelve specimens from Arequipa and Yura (northwest of Arequipa) differ from the Ica series in having the under parts a darker gray with darker collars and with a prominent white spot below the collar. Above, some agree exactly with Ica specimens while others are grayer with a greater admixture of black hairs.

Two specimens from near Cuzco are darker still, both above and below but lack the white spot below the collar.

When Thomas described *C. t. pallidior* he compared it with Cuzco specimens and with one from Tambo on the coast near Maldonado. As he described it as paler than *tschudii* he must have had dark individuals. A paratype of *pallidior* matches closely a topotype of *tschudii*.

Cavia tschudii pallidior Thomas, renamed *Cavia tschudii arequipae* Osgood should be considered a synonym of *Cavia tschudii tschudii* Fitzinger.

It is possible that the Cuzco specimens represent an unnamed race that intergrades with *tschudii* in the Arequipa region, one being a coastal and the other a mountain race, but lack of material from intervening areas does not warrant its recognition at this time.

East of the Andes in southern Peru is found a dark cavy that is here described as:

Cavia tschudii osgoodi subsp. nov.

Type.—No. 52472 Chicago Natural History Museum. Limbani, 12,000 feet, District Limbani, Province Sandia, Department Puno, Peru. Adult female. Skin and skull. Collected 1 October 1941 by C. C. Sanborn. Original number 2906.

Color.—Very dark, almost reddish brown heavily mixed with black. Under parts dark buffy gray on center of belly, collar dark brown. Quite similar to *C. t. atahualpae* from Cajamarca.

Skull.—Differs from *atahualpae* by the low, not arched, braincase and in having a much wider nasopharyngeal fossa.

Measurement of type.—Head and body 270 mm.; hind foot 49. Skull: greatest length 60.4 mm.; condylo-basal length 56.0; zygomatic breadth 31.7; interorbital breadth 11.7; mastoid breadth 25.-; length of bulla 13.1; nasals 20.5x7.7; upper tooth row 14.9.

Specimens examined.—Type and three paratypes, all females.

Remarks.—Limbaní lies on the east side just over the crest of the Andes, in a region of clouds and heavy rain. It is the type locality of numerous dark colored races. This form is named for the late Dr. Wilfred H. Osgood in recognition of his early important work on the genera of the Caviidae.

PROCEEDINGS
OF THE
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SOME RECENT COLLECTIONS OF *PLETHODON*
FROM VIRGINIA WITH THE DESCRIPTION
OF A NEW FORM

BY ARNOLD B. GROBMAN

Department of Biology, University of Florida

Recent collections by a number of herpetologists necessitate an extension of the arrangement of certain of the plethodons in Virginia as given in the most recent of the general reviews (Bishop, 1943; Grobman, 1944). The ranges of *Plethodon richmondi* and *P. wehrlei* are extended in Virginia and a new form of the flecked plethodons (*Welleri* Group) is described.

Messrs. Clifford H. Pope, Harry G. M. Jopson, Hubert I. Kleinpeter, and Richard L. Hoffman have made separate and successful efforts to collect additional pertinent specimens, and have thereby contributed materially to these notes. I am also indebted to Dr. Doris M. Cochran, Mr. M. Graham Netting, and Mr. James A. Fowler for loaning me comparative material from the collections under their care.

Plethodon richmondi Netting and Mittleman

Bishop (1943: 239) maps the distribution of *richmondi* as exclusive of Virginia, and Grobman (1944: 312) shows a single locality in Virginia based upon a specimen in the Carnegie Museum (No. 18499) collected at Blacksburg in Montgomery County. The following material extends the range eastward well into the Valley and Ridge Province in Virginia and thereby confirms the Blacksburg record. A series of specimens (R.L.H.¹ 10, 11, 48, 99, 155, 469-72, 594-96, 759, 972-73, 990, 992, and 1086) was collected by Richard L. Hoffman in the vicinity of Clifton Forge, Allegheny County. Additional new records include Porters Cave, State Rte. 42, 12 miles northeast of Clifton Forge, Bath Co. (R.L.H. 901); Sizer's Cave, about 4 miles south of Newcastle, State Rte. 42, Craig Co. (R.L.H. 946); Natural Bridge near Buck Hill Cave entrance, Rockbridge Co. (J.A.F. 1051); and vicinity of Warm Springs, Bath Co. (J.A.F. 159). This Virginia material has not been compared with typical *richmondi* in order to evaluate racial variation.

¹Abbreviations used in this paper designate the collections of the following institutions or persons as follows: A.M.N.H., American Museum of Natural History; A.N.S.P., Academy of Natural Sciences of Philadelphia; C.A.S., Chicago Academy of Sciences; C.M., Carnegie Museum; C.N.H.M., Chicago Natural History Museum; D.B.U.F., Department of Biology, University of Florida; J.A.F., James A. Fowler; M.C.Z., Museum of Comparative Zoology; R.L.H., Richard L. Hoffman; S.C.B., Sherman C. Bishop; U.M.M.Z., University of Michigan Museum of Zoology; and U.S.N.M., United States National Museum.

Plethodon wehrlei Fowler and Dunn

In a recent paper (Netting, Green, and Richmond, 1946) records of *wehrlei* in Virginia are discussed. An immature specimen (C.N.H.M. 57029), presumably of this species, was subsequently collected near the side of the road close to the junction of State Rte. 56 and the Blue Ridge Parkway in Nelson County during September, 1946, by Hulda and Arnold Grobman. The records of Netting, Green, and Richmond (1946: 157-60), for Montgomery, Roanoke, and Highland Counties extend the range of *wehrlei* eastward into the Valley and Ridge Province although these contributors are careful to point out that the habitat seems to be continuous from the Appalachian Plateaus into the Valley and Ridge Province. The Nelson County record, if the salamander in question is correctly identified, extends the range eastward into still another physiographic province, the Blue Ridge. I am not able to state, however, whether or not it is possible to trace the habitat continuously between the Nelson County station and the nearest known localities to the west, though I doubt that there is such continuity.

On a trip from Rochester, New York, to Gainesville, Florida, in September of 1946, my wife and I drove along the Skyline Drive in the Shenandoah National Park in Virginia. While along the Drive we stopped to observe casually the salamander fauna with no particular thought of collecting and preserving specimens. At our first stop, however, we came upon a specimen which we thought to be of interest in representing either a considerable range extension of *nettingi* or *welleri* or in being an example of a new form of this group of *Plethodon*. This and additional specimens were saved and subsequent examination suggested that the latter assumption was correct. Additional trips were made to obtain more material; the personnel consisted of: Aug., 1947, Hoffman, Kleinpeter, and myself; Sept., 1947, my wife and myself; Sept., 1947, Kleinpeter and S. A. Peabody; July, 1948, Jopson; and Aug., 1948, Pope and family. A total of thirty specimens of the new form was in this way accumulated. As far as I am aware, the first known specimen of this form was taken by my wife and so it is with great pleasure that I suggest the new form be called:

Plethodon huldae, sp. nov.

Diagnosis—A small flecked *Plethodon* morphologically similar to *Plethodon nettingi* from which it most conspicuously differs in having one more costal groove and a lighter venter.

Holotype—U.S.N.M. 127955, collected along the foot trail to Hawksbill Mountain about 100 yards from the Skyline Drive at an elevation of approximately 3500 feet in Madison County, Virginia in the late morning of September 5, 1947, by Hulda and Arnold Grobman.

Paratypes—All from Virginia. M.C.Z. 26588, Madison Co., 2 miles north of Hawksbill Mt. at spring nearly opposite juncture of foot trail and Skyline Drive, 3350 feet, Sept., 1946, H. and A. Grobman; A.M.N.H. A53996-97, Page Co., near Skyland campsite about ½ mile southwest of Stony Man Mt. and about ¼ mile west of Skyline Drive, 3650 feet, September, 1946, H. and A. Grobman; U.S.N.M. 127956-58, type locality, Aug., 1947, H. I. Kleinpeter and S. A. Peabody; U.M.M.Z. 98748-51,

Madison-Page Co. line, trail to Stony Man Peak from Skyland campsite, 3750 feet, July 18, 1948, H. G. M. Jopson; C.N.H.M. 56501-08, extreme northeast Rockbridge Co., 11.4 miles north of intersection of U. S. Rte. 60 and Blue Ridge Parkway, just above point where Parkway crosses a branch of Nettle Creek, 3150-3300 feet, Aug. 9, 1948, C. H. Pope and family; C.N.H.M. 56509, Roanoke Co., on Poor Mt., a few miles south of Salem, 3400-3600 feet, Aug. 19, 1948, Hallowell Pope; A.N.S.P. 26054 and C.A.S. 14682, Nelson Co., side of road near juncture of State Rte. 56 and Blue Ridge Parkway, 3000 feet, Sept., 1946, H. and A. Grobman; C. M. 28897-99, S.C.B. (3 specimens), and D.B.U.F. 2208-09, type locality, Aug. 7, 1947, Richard Hoffman, H. I. Kleinpeter, and A. Grobman.

Description of the species—*Plethodon huldae* belongs to that group of *Plethodon* that includes *richmondi*, *welleri* and *nettingi*. These are all relatively small salamanders with a dark dorsum flecked in life with green, bronze, gold, silver or brassy, as described by different investigators. (The diversity of these markings may be in their recording rather than in their actual color.) These flecks tend to disappear in preserved specimens within a very short time. Of the three previously described forms, *richmondi* is characterized by a rather elongate body and, associated with it, a high number of costal grooves (20 to 23 as counted by Netting and Mittleman, 1938). At the other extreme of the series is *welleri* with, usually, 16 costals. *P. nettingi* generally has 18, and *huldae*, 19 costals. *P. c. cinereus*, which I do not believe is as closely related to these forms as they are to each other, has a number of costals similar to that of *huldae*. In the accompanying table (Table I) there are listed costal groove counts made by myself within a short period of time and as uniformly as possible.

TABLE I
COSTAL GROOVE COUNTS OF CERTAIN FORMS OF *Plethodon*
AS DESCRIBED IN THE TEXT

Costal Grooves	15	16	17	18	19	20
<i>P. huldae</i>	—	—	—	5	20	5
<i>P. nettingi</i>	—	—	4	20	2	.
<i>P. welleri</i>	2	18	4	—	—	—
<i>P. c. cinereus</i>	—	—	—	15	26	1

The maximum count obtainable was recorded by including a groove over the axilla, whether or not it was well defined so long as there was room for it, and by including all grooves in the region of the groin regardless of any ventral anastomoses or lack of them. Counts were made on both sides of a specimen and recorded separately; occasionally a difference of one groove between the right and left sides of an individual was observed. No attempt was made to force agreement for it was thought that less bias would obtain by permitting occasional errors to be randomized than by subjecting selected individuals to a more detailed study than other specimens received. The *cinereus* studied were specimens taken with the collections of *huldae*. The *nettingi* and *welleri* counts were made on specimens from the Carnegie and U. S. National

Museums. The species of the Welleri Group, arranged in descending order of their costal groove counts, are: *richmondi*, *huldae*, *nettingi* and *welleri*.

P. richmondi, *nettingi* and *huldae* are alike in that the dorsal flecks are relatively discrete; in *welleri* they are frequently coalesced.

The number of vomerine teeth in each series seems to be about the same for each form with an average number of approximately 6.

It is, of course, almost impossible to form a reliable impression of maximum size without an abundance of material. With the information I have available at the present time, it might be said that the size order follows that of the number of costal grooves, but the only fair statements are that *richmondi* is the longest, and *welleri* the shortest, of the four. I do not have figures sufficient to establish that *huldae* is larger than *nettingi* although I suspect that that is the case.

On the specimens I have studied, I find that the number of costal grooves between the toes of adpressed limbs in adults average 5 in *welleri*, 6 in *nettingi* and 7 in *huldae*. (I have chosen to use grooves rather than folds because the former are more discrete and do not require the juggling of fractions the usual method does.) I have restricted these comparisons to adults because of the ontogenetic change that has been demonstrated in this character by Netting and Mittleman (1938: 292), Grobman (1943: 9-11), and others.

Three of the characters discussed above (grooves between adpressed toes, maximum size, and number of costal grooves) are obviously associated and probably do not indicate as much genetic dissimilarity as their listings might suggest. If other recognizable forms within the series are to be expected, the most likely place would be between *huldae* and *richmondi*.

The venter of *huldae* is progressively darker posteriorly. The throat is speckled, the abdomen mottled, and the tail dark. There is a similar, but much less pronounced anterior-posterior pattern gradient in *nettingi*. The throat and anterior abdomen of *huldae* are not matched by *nettingi* but the darker parts are. *P. huldae*, then, has a lighter venter than *nettingi*.

I am indebted to Mr. Pope for the following color description of one of the paratypes (C.N.H.M. 56509) taken in life: "Dorsum: Ground color uniform dark brown, almost black. Moderately profuse silvery flecks over head and back; similar flecks somewhat more profuse on tail except near its tip where they are scarcely visible or lacking. Flecks about as profuse on limbs as on back. Ventrums: Purplish black with profuse irregularly arranged and shaped light areas. Anterior to gular fold, light areas become progressively more profuse until they predominate and finally all but replace the purplish black ones. Lower jaw narrowly bordered with purplish black anteriorly. Soles light colored except for the purplish black webbing. Limbs purplish black except for light creases and a very few light areas like those of the belly. Pattern of ventrum tends to invade lower sides. Eye: Iris black, narrowly bordered with gold above."

Habitat—The great majority of specimens were collected from under rocks, occasionally from under, or in, a log. The sites of collection were high and well forested, usually with a mixed stand of conifers and hardwoods. There was usually plenty of ground cover. *Plethodon c. cinereus*

was found in the same specific areas and seemed to outnumber *huldae* about 3 or 4 to 1.

Physiographic and altitudinal restrictions—All known localities are in the Blue Ridge Province at altitudes between 3000 feet and 3750 feet. The range may therefore be given as above 3000 feet in the Blue Ridge Province in suitable habitats between Poor Mt., Roanoke Co., and Stony Man Mt., Page-Madison Cos.

Identification of *cinereus* and *huldae*—In the general area under discussion *cinereus*, as far as is known, exists exclusively in the red-backed phase. Since *huldae* comes to resemble lead-backed *cinereus* after being in preservative, it may be that there are other specimens of *huldae* in collections that have been identified as *cinereus*. A similar situation existed at the time of the description of *P. richmondi* (Netting and Mittleman, 1938: 287). In the present instance the number of costal grooves will be of no help in segregating the confused specimens.

Relationships in the Welleri Group—The Welleri Group consists of four species as presently outlined. Geographically, *richmondi* is related sympatrically to *nettingi* and perhaps to *huldae*. It is also the largest form with the highest costal groove count and it is suggested (which suggestion is in agreement with that of Green, 1938: 298-99) that a *richmondi*-like animal was ancestral to the other forms in the group. *P. huldae*, *nettingi* and *welleri*, are montane dwarf derivatives with the degree of differentiation being in that order.

Use of the binomial—The most closely related form, morphologically, to *huldae* is *nettingi*; these forms seem to be distinct and could either be considered separate species or "insular" races. The most closely related form, geographically, is *richmondi*; there is, at this writing, no evidence for intergradation between the two. On the basis of present information and current systematic procedure, it seems more reasonable to refer to *huldae* with a binomial than with a trinomial.

Related distributional problems—Further desirable distributional information regarding *P. huldae* includes range extensions to the north; intermediate stations between Poor Mt. and Nelson Co.; and altitudinal range of the form. Collectors in the northern part of the Southern Section of the Blue Ridge between Poor Mt., the southernmost record for *huldae*, and Mt. Rogers, the northernmost record for *welleri* (Hoffman and Kleinpeter, 1948: 107), should search for a flecked *Plethodon*. Intergrades, or an intermediate form, between *welleri* and *huldae* may be anticipated. Pt. Lookout, rising to above 4600 feet, might well be a locality involved.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW POCKET GOPHER FROM SOUTHEASTERN
UTAH

BY KEITH R. KELSON

In the comprehensive taxonomic work on the pocket gophers of Utah, Durrant (The Pocket Gophers (Genus *Thomomys*) of Utah. Univ. Kansas Publ., Mus. Nat. Hist., 1(1):1-82, Aug. 15, 1946) referred the animals from the mountains east of the Green and Colorado rivers in Utah to the subspecies *Thomomys talpoides fossor*, but mentioned (p. 22) that they were not typical. Furthermore, he remarked that, when more material became available, they might prove to be sufficiently different from *T. t. fossor* to merit separation and naming. Subsequently, additional specimens were collected by field parties sponsored by the University of Utah Research Council. Comparison of these animals with near topotypes of *T. t. fossor* indicates that they do constitute an heretofore undescribed subspecies. It seems appropriate to name the new animal in honor of Professor Stephen D. Durrant who has contributed so materially to the understanding of the taxonomy of this group of mammals in Utah. The name and description of the new form are as follows:

***Thomomys talpoides durranti* new subspecies**

Type.—Female, adult, skin and skull, No. 5603, Museum of Zoology, University of Utah, Johnson Creek, 14 mi. N Blanding, 7,500 ft., San Juan County, Utah; May 23, 1947; collected by Keith R. Kelson, original number 201.

Range.—The mountains east of the Green and Colorado rivers in Utah, bounded by the southern flank of the East Tavaputs Plateau on the north and the Abajo [Blue] Mountains on the south.

Diagnosis.—Size medium (see measurements); hind foot average for the species. Color: Upper parts Cinnamon-Brown grading to Cinnamon-Buff on flanks and inguinal region (capitalized color terms according to Ridgway, Color Standards and Color Nomenclature, 1912); underparts Avellaneous with deep Mouse Gray undertone; chin and openings to the cheek pouches white; ears medium in size with rounded or pointed pinnae, pinnae with moderate pigmentation; postauricular patches re-

duced, between Dusky Neutral Gray and black; proximal half dorsal surface hind feet same color as upper parts of body, distal half with short whitish hairs; tail white below, Cinnamon-Brown above in the proximal half, grading to white distally. Skull: Size medium, angular and narrow; frontonasal region flat or nearly so; nasals rounded proximally; premaxillae extending posterior to nasals; rostrum long; interparietal boardly triangular; tympanic bullae large and well inflated ventrally; basioccipital narrow; supraoccipital markedly lengthened, developed as a distinct shelf rather than as a crest; upper incisors long and moderately recurved; molariform dentition light.

Measurements.—Average and extreme measurements in millimeters of 6 males and 8 females from the type locality are, respectively, as follows: Total length, 208 (224-201), 208 (220-195); length of tail, 61 (66-54), 59 (63-55); length of hind foot, 28 (32-26), 28 (31-26); basilar length, 31.6 (35.0-31.0), 30.3 (31.2-28.8); length of nasals, 13.7 (14.9-13.1), 13.0 (14.1-11.9); zygomatic breadth, 20.2 (20.8-19.7, available from only 3 males), 20.7 (21.5-19.8); mastoid breadth, 17.1 (17.9-16.8), 17.7 (18.5-16.3); interorbital breadth, 6.3 (6.5-6.1), 6.3 (6.5-5.8); alveolar length of upper molariform series, 7.1 (7.6-6.8), 7.2 (7.7-6.8); extension of premaxillae posterior to nasals, 0.6 (0.8-0.1), 0.5 (0.9-0.0); length of rostrum, as measured from the dorsal point of union of the lacrimal, frontal, and maxilla to the tip of the nasal, 15.6 (17.1-15.0), 15.4 (16.2-14.8); breadth of rostrum, 7.3 (7.8-7.0), 7.2 (7.5-6.8).

Comparisons.—From *Thomomys talpoides oculus*, *T. t. durranti* can be distinguished as follows: Size larger throughout. Color: Darker, brownish as opposed to grayish. Skull: More angular and massive; frontonasal region more nearly flat as opposed to gently arched; nasals and rostrum longer; supraoccipital shelf more pronounced, extended farther posteriorly; incisors markedly longer and less recurved; tympanic bullae smaller; interorbital breadth actually as well as proportionately narrower; anterior palatine foramina larger; interpterygoid space more narrowly V-shaped; interparietal triangular rather than suborbicular.

From *Thomomys talpoides vinta*, *T. t. durranti* differs as follows: Skull: Longer and narrower; rostrum and nasals longer; interparietal triangular rather than pentagonal; tympanic bullae larger and more inflated ventrally; basioccipital narrower; supraoccipital a shelf rather than a crest; frontonasal region more nearly flat.

From 6 males, near topotypes, of *Thomomys talpoides fossor*, which it most nearly resembles, from La Plata City, 9,200 feet, La Plata County, Colorado, *T. t. durranti* differs as follows: Tail shorter (61 mm. as opposed to 65 mm.). Color: Slightly lighter dorsally in specimens of comparable molt; postauricular patches smaller. Skull: More angular; more nearly flat in the frontonasal region as opposed to gently arched; basilar length averages slightly greater (31.6 mm. as opposed to 30.6 mm.); extension of the premaxillae posterior to the nasals greater (0.6 mm. as opposed to 0.05 mm.); rostrum broader (7.3 mm. as opposed to 6.9 mm.); supraoccipital shelf extended farther posteriorly; interparietal averages broader in proportion to the length; upper incisors not as procumbent; cranial root of the zygomatic arch heavier.

Remarks.—In his original description of *Thomomys fossor*, Allen

(Bull. Amer. Mus. Nat. Hist., 5:51, April 28, 1893) placed particular emphasis on the fact that the premaxillae terminated posteriorly on the same line as the nasals. The near topotypes from La Plata City, La Plata County, Colorado, available to me, agree in this character with Allen's description. Other specimens of *T. t. fossor* from Colorado which I have examined do not agree with the description in this particular, nor do those of the near topotypical series studied by Durrant (p. 26-27). Since the La Plata series also agrees with the description in other characters, I consider it to be fairly typical. Indeed, the variability is so great in animals from Colorado, assigned to *T. t. fossor* that I have studied that it seems apparent that when the species *Thomomys talpoides* of that state has been thoroughly re-studied, many of the animals now understood to belong to the subspecies *T. t. fossor* will be found to comprise several unnamed kinds.

Twelve specimens from the La Sal Mountains in Grand and San Juan counties, Utah, are intergrades between *T. t. fossor* and *T. t. durranti*. The degree of intergradation appears to be proportional to the relative distance that the La Sal Mountains are removed from the two type localities. They resemble *T. t. durranti* in the extent of the supraoccipital shelf, length and curvature of the upper incisors, heavy anterior root of the zygomatic arch, length of the tail and overall coloration; they are like *T. t. fossor* in the length of the hind foot; they are intermediate between the two in the shape of the frontonasal region, and the posterior extension of the premaxillae; they exceed both *T. t. durranti* and *T. t. fossor* in total length, basilar length, and the breadth of the rostrum. These specimens more nearly resemble *T. t. durranti* to which they are here referred.

Specimens from Oak Spring, Middle Fork Willow Creek, 14 miles north Thompson, Grand County, Utah, were considered by Durrant (p. 22) to be intergrades between *T. t. ocius* and *T. t. fossor*, and referable to the latter. These animals are here referred to *T. t. durranti* primarily on distributional concepts. A series of 5 specimens from PR Springs, 43 miles south of Ouray, 7,950 feet, Uintah-Grand County line, Utah, and 3 specimens from Brown's Corral, 20 miles south of Ouray, 6,250 feet, Uintah County, Utah, are intergrades between *T. t. durranti* and *T. t. ocius* the range of which occurs to the north of these localities. In general the skulls are more like those of *T. t. ocius*, but show features of *T. t. durranti* in the shape of the interparietal and the size of the tympanic bullae. The color of the specimens from PR Springs is like that of *T. t. durranti*, while that of the specimens from Brown's Corral is like that of *T. t. ocius*. Both are closer to *T. t. ocius* to which they are here referred. Gradual intergradation is thus demonstrated between *T. t. durranti* and *T. t. ocius* in a series of specimens taken along a north-south transect. The ranges of the two subspecies may be regarded as meeting between the PR Springs and Oak Creek localities or, roughly, along the southern crest of the East Tavaputs Plateau. Specimens from the vicinity of Vernal, Uintah County, Utah, north of the above localities, were regarded by Durrant (p. 18) as intergrades between *T. t. ocius* and *T. t. uinta*. Durrant also commented on intergradation between *T. t. uinta* and *T. t. rarus* (p. 16) and suggested slight intergradation between *T. t. uinta* and *T. t. pygmaeus* (p. 15). Intergradation is, then,

demonstrable in the several subspecies of the *Thomomys talpoides* group from the eastern half of Utah.

In view of the foregoing, *Thomomys talpoides fossor* is no longer considered to be a part of the fauna of Utah.

Specimens examined.—Total, 50, from the Museum of Zoology, University of Utah, distributed as follows: *Grand County*: Warner R. S., La Sal Mountains, 9,750 ft., 3; *San Juan County*: 1 mi. SE Mesa R. S., La Sal Mountains, 9,200 ft., 4; 3 mi. W Geyser Pass, La Sal Mountains, 10,000 ft., 5; Dalton Spring, 5 mi. W Monticello, Abajo [Blue] Mountains, 8,300 ft., 14; Gooseberry R. S., Elk Ridge, 8,300 ft., 5; Duck Lake, 1 mi. S Gooseberry R. S., Elk Ridge, 8,400 ft., 5; Johnson Creek, 14 mi. N Blanding, 7,500 ft., 14.

Contribution from the Division of Biology, Department of Vertebrate Zoology, University of Utah, Salt Lake City, Utah.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW DRYMARIA (CARYOPHYLLACEAE)
FROM MEXICO

BY F. R. FOSBERG

Among H. S. Gentry's Rio Mayo collections, no. 2669 is a slender, small-leaved species of *Drymaria*, at first glance resembling *D. leptophylla*, to which it was, indeed, referred by Standley (as *D. tenella*). Its uniform glandular puberulence, its broader leaves, and a slight difference in habit suggested that it did not belong there. Careful comparison showed that it is not especially close to that species and that it is apparently an undescribed species which may be appropriately named for the collector, whose explorations in Mexico have materially added to our understanding of its botany.

Drymaria gentryi Fosberg, n. sp.

Herba gracilis diffusa holo glandulo-puberula multiflora, foliis lanceolatis tenuis; flores pedicellati, sepalibus inaequalibus subtrinervis, petalibus sepales excedantibus valde bifidis spatulatis, staminibus 5.

Diffuse slender herb up to 12 cm. tall, branched from first node above the rosette, fundamentally trichotomous but with one lateral branch weaker or suppressed until the cyme is reached, when the central branch is replaced by a flower, vegetative parts and calyx thinly but prominently glandular puberulent; rosette leaves more or less orbicular, blade about 2 mm. across, petiole about 2 mm. long, cauline leaves lanceolate, thin, up to 1 cm. long, 2 mm. wide at middle, reduced upward on plant, obscurely 1-nerved, sub-petiolate; stipules setiform-subulate, 1-1.5 mm. long, more prominent above, not more than 4 at a node; cymes dichotomous, capillary, making up the upper third of the plant, with central flower on pedicel 5-7 mm. long, cyme with 6-7 ramifications, the ultimate ones showing only a slight tendency to become monochasial; sepals strongly unequal, the outer shortest, the longest about 2 mm. long, the green part acute or somewhat acuminate, weakly trinerved, the central nerve much the strongest; petals about one and one half times as long as the longest sepal, deeply bifid, about two thirds or three fourths the way to the base, lobes broadly spatulate; stamens 5, somewhat unequal, shorter than sepals, anthers linear-oblong; ovary about one third the length of the calyx, becoming almost as long as the calyx in fruit; seeds 6-7 in capsule, apparently dark chestnut brown (no mature ones seen). *Mexico*: Chihuahua: Los Cascarones, Rio Mayo, on cold rock of cliffs in transition

zone, pine slope, Sept. 11, 1936, *H. S. Gentry* 2669 (type sheet in U. S. National Herbarium, duplicates seen in U. S. National Arboretum, Missouri Botanical Garden). Other duplicates of this collection may probably be found elsewhere filed with *Drymaria tenella*, under which name they were originally distributed and cited by Gentry, Carn. Inst. Wash. Pub. 527:114, 1942.

This peculiar species seems more or less intermediate between the group of small annuals centering around *D. leptophylla* and the group containing *D. tenuis* and *D. anomala*. It approaches the latter group, particularly *D. tenuis*, in its tendency for one lateral branch to be suppressed, the strong mid-nerve of the sepals, and its lanceolate leaves. The latter, however, are similar also to those of *D. depressa*, of the other group. The multiflorous cymes, long petals, 5 stamens, and general appearance influence me to keep it for the present in the group with *D. leptophylla*, in which it is possibly closest to *D. effusa*. To this, however, it cannot be regarded as very close, as it differs in the broad leaves, acute sepals, puberulence and other features.

PROCEEDINGS
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A NEW SUBSPECIES OF COTTON RAT, *SIGMODON*
HISPIDUS, FROM MICHOACÁN, MÉXICO

BY E. RAYMOND HALL

Among mammals collected in the vicinity of Zamora, Michoacán, in 1943, only one individual of the genus *Sigmodon* was included. That cotton rat differed so much from any named kind that a manuscript description, including a new name, was drawn up for the animal, but being reluctant to propose a new name on the basis of only one specimen, I laid the description aside. In December past, on a visit to the Biological Surveys Collection in the United States National Museum a second specimen, from Zamora, was found. In as much as the second specimen agrees with the first and since each of the two differs from any previously described kind the following account is offered as contributing to our knowledge of this group of rodents of Austral and Tropical distribution.

Sigmodon hispidus atratus new subspecies

Type.—Male, subadult, skin and skull; no. 100628, Mus. Vert. Zool.; 6½ mi. W Zamora, 5950 ft., Michoacán, México; March 27, 1943; obtained by E. R. Hall, original no. 6009.

Range.—Known only from Zamora and the type locality.

Diagnosis.—Size medium (see measurements); hind foot short; color blackish yellow on upper parts and sides; whitish on underparts, feet, and under side of tail; tail blackish above and haired densely enough to obscure the annulations; skull (see figs. 1-3) deep; anterior projection of maxillary arm of zygoma short and straight; anterior palatine foramina constricted posteriorly.

Comparisons.—From *Sigmodon hispidus mascotensis* Allen as known by specimens of equal age from Pátzcuaro and Tacámbaro, *S. h. atratus* differs in hind foot shorter; upper parts darker (more nearly black); tail more densely haired; skull shorter and more convex in dorsal longitudinal outline; anterior palatine foramina posteriorly constricted rather than parallel-sided; anterior process of maxillary arm of zygoma shorter and less decurved (less of a hook). The same differences are apparent in comparisons with other specimens of *S. h. mascotensis* from the state of Jalisco, more exactly from Tuxpan, Las Canoas and Artenkiki.

Remarks.—The short hind foot, the relatively hairy tail with resultant concealment of the annulations on the tail, and the high degree of convexity of the skull dorsally in the longitudinal axis are points of re-

semblance to the *S. melanotis* group of cotton rats. Nevertheless, the differences between *S. h. atratus* on the one hand and *Sigmodon melanotis* Bailey and *Sigmodon alleni* Bailey on the other hand, are of such a nature that I judge the newly named animal to bear no close relationship to *S. melanotis* and *S. alleni*. From them, *S. h. atratus* differs in more grayish and less reddish upper parts, and longer (but no more decurved) anterior process of the maxillary arm of the zygoma. In these two respects the newly named animal shows greater resemblance to *Sigmodon hispidus*. Furthermore, some specimens of *Sigmodon hispidus mascotensis* from other localities in Michoacán (Queréndaro, 1 specimen; Huacana, 8; Los Reyes, 3; La Salada, 2), like *S. h. atratus*, have a short and straight anterior process on the maxillary arm of the zygoma, and the specimens from Los Reyes are almost as dark as *S. h. atratus*. The above evidence is the basis for regarding the newly named kind of *Sigmodon* first as more closely allied to *Sigmodon hispidus* than to *Sigmodon melanotis* and second as only a subspecies of *Sigmodon hispidus*.

The constriction of the posterior part of the anterior palatine foramina, so well shown in the holotype of *S. h. atratus* and present in lesser degree in the referred specimen from Zamora, appears rarely as an individual variation (unrelated to age or sex), at least in northern populations of *Sigmodon hispidus*. In *S. h. atratus* our knowledge of the constancy of this feature and its taxonomic worth, therefore will remain uncertain until more specimens of *S. h. atratus* are available.

The specimen of *S. h. atratus* from Zamora (♀ no. 120268 U. S. B. S.) is slightly the older of the two but unfortunately has a broken skull. The younger specimen is selected as the holotype because its skull is intact.

Acknowledgment is made to Dr. H. H. T. Jackson and Mr. Stanley P. Young for their courtesy in allowing use of materials in their charge and to Miss Annie M. Alexander and the John Simon Guggenheim Memorial Foundation for assistance with the field work in Michoacán.

Measurements (first the type and second no. 120268).—Total length, 228, 245; length of tail, 112, 113; length of hind foot, 30, 33; length of ear from notch, 18, —; weight, 53.2, — grams; basal length, 25.7, —; length of nasals, 11.2, 11.4; zygomatic breadth, 18.0, —; mastoid breadth, 12.8, 13.5; alveolar length of upper molar series, 6.1, 6.1.

Specimens examined.—Two, the type and one from Zamora.

Museum of Natural History, University of Kansas, Lawrence, Kansas.
Transmitted January 2, 1948.

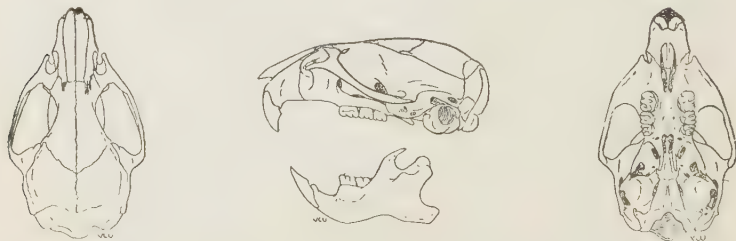


PLATE IX

FIGS. 1-3. Three views of the skull of the type specimen of *Sigmodon hispidus atratus*. X 1.

PROCEEDINGS
OF THE
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A NEW *BRUNFELSIA* FROM BRAZIL

By C. V. MORTON

Investigations of the genus *Brunfelsia* (Solanaceae) have uncovered the following new species, previously misidentified.

Brunfelsia amazonica Morton, sp. nov.

Lamina foliorum oblongo-elliptica, apice abrupte acuminata, basi cuneata, subcoriacea, nitida, fere glabra; flores solitarii vel bini, pedicellis elongatis, curvatis, apice incrassatis; calyx campanulatus, irregulariter 5-lobatus, glaber; corolla hypocrateriformis, tubo crasso, limbo amplo, patente.

Shrub, branchlets subterete, about 3 mm. in diameter, glabrous, shining, the cortex exfoliating, the internodes normally 1-2 cm. long; petioles short, 3-5 mm. long, 1.5 mm. thick, glabrous, transversely corrugate; leaf blades oblong-elliptic, 6-11 cm. long, 2.5-4.5 cm. broad, abruptly acuminate at apex, the apex itself rounded, entire, subcoriaceous, deep green, shining and glabrous above, beneath paler and glabrous except for scattered microscopic hairs, the lateral veins about 5 pairs, strongly arcuate and anastomosing well within the margin; inflorescence terminal, 1 or rarely 2-flowered, the peduncle very short or none, the pedicels elongate, 15-19 mm. long, stout, conspicuously thickened toward apex, glabrous; calyx green, campanulate, 9-12 mm. long, glabrous, shining, irregularly 5-lobate, the lobes ovate, strongly unequal, 2.5-6 mm. long, acute; corolla whitish, hypocrateriform, about 3 cm. long, the tube cylindric, 2-2.3 cm. long, 2.5-3 mm. thick, lacking an annulus within, glabrous, the limb spreading, 2.5 cm. wide or more, the lobes subequal, ovate-orbicular, about 1 cm. long, filaments adnate to corolla for most of their length, the shorter ones free for 3 mm., the longer for 5 mm., glabrous; anthers included, orbicular, the cells completely confluent; style glabrous, included; stigma bilobed; ovary conic, 2 mm. long, glabrous.

Type in the U. S. National Herbarium, no. 1,693,434, collected at Estrada da Raiz, Manáos, State of Amazonas, Brazil, in secondary forest, March 24, 1937, by A. Ducke (no. 430). A second specimen with the same data but collected March 18, 1943, is also in the National Herbarium.

The type specimen was identified by Dr. Ducke as *Brunfelsia guianensis* Benth.¹, a little-known species described from two specimens from French Guiana and Surinam, collected by Perrottet and Hostman (no. 1278) respectively. Certain details of the description suggested that Dr. Ducke's plant was misidentified and consequently Dr. Cotton was asked to supply

a photograph of these two collections. He replied that he was unable to locate a Perrottet specimen at Kew, but that there were two sheets of the Hostman plant, one from the Bentham Herbarium. This sheet, which must be considered as the type of the species, Dr. Cotton very kindly lent for study. The specimen consists of a single branch, bearing 6 leaves, one complete flower and two old flowers represented by calyces only. The label reads, "1278 *Brunfelsia guianensis* Benth, in DC. Prod. 10:200, *Arbor, fl. candidus*, Surinam, *Hostmann* 1843." Bentham's description of the fruit was doubtless taken from the Perrottet specimen, which is probably in the Paris Museum.

Brunfelsia amazonica is surely distinct from *B. guianensis*, the principal characters being shown in the following key:

Corolla tube very slender, about 0.8 mm. thick; corolla limb about 1.5 cm. wide; calyx about 6 mm. long; pedicels straight, very short, 3-4 mm. long; leaf blades obovate, strongly attenuate at base, the lower surface bearing numerous microscopic hairs . . . *B. guianensis*.

Corolla tube stouter, 2.5-3 mm. thick; corolla limb 2.5 cm. wide or more; calyx about 9 mm. long; pedicels curving, 15-19 mm. long; leaf blades oblong-elliptic, cuneate at base, nearly glabrous beneath.

B. amazonica.

¹In DC. Prodr. 10:200. 1846.

PROCEEDINGS
OF THE
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A NEW SUBSPECIES OF FUNNEL-EARED BAT
(*NATALUS MEXICANUS*) FROM EASTERN
MEXICO

BY W. W. DALQUEST AND E. RAYMOND HALL

When *Natalus mexicanus* was named in 1902 by Gerrit S. Miller, Jr. (Proc. Acad. Nat. Sci. Philadelphia, p. 399), it was known to have an extensive geographic range in Mexico. Nevertheless, only a few individuals were available from any one of the several localities of known occurrence, and most of the specimens were preserved in alcohol. Consequently, it was impossible to learn much from this material about individual variation and it was difficult to learn much about geographic variation. Specimens recently obtained in large series and mostly prepared as conventional study skins with skulls, reveal that there are two well-marked color phases and also that there is geographic variation in color and in size of skull. In the dry region of Baja California (type locality of *N. mexicanus* at Santa Anita) and northwestern Mexico, bats of the species concerned are pale and have small skulls. In eastern Mexico the animals are constantly different in their darker coloration and they have large skulls. The dark-colored animal with the large skull appears to be an hitherto unrecognized subspecies which may be named and described as follows:

Natalus mexicanus saturatus new subspecies

Type.—Male, adult, skin with skull, no. 23815, Mus. Nat. Hist., Univ. Kansas; 3 kilometers east of San Andreas Tuxtla, 1000 feet elevation, Veracruz, Mexico; 10 January 1948; obtained by Walter W. Dalquest; original no. 8621.

Range.—Eastern Mexico from southern San Luis Potosí to Campeche; southern extent of range unknown.

Diagnosis.—Total length 99 (96-105) mm. with tail comprising half this length; skull with long (6.9 mm.) maxillary tooth-row; skull with almost vertical occiput and conspicuous sulcus at posterior border of parietals; color dark, pelage in red phase ranging from near (14 j) Amber Brown (capitalized color terms after Ridgway, Color Standards and Color Nomenclature, Washington, D. C., 1912) to between Burnt Sienna and Chestnut; in "gray" phase near (h) Clay Color.

Comparison.—From *Natalus mexicanus mexicanus* known to us by seven specimens from Baja California (6 from Las Cuevas, 23° 34' N, 109° 39' W and one from Santa Anita) and 49 from 4 miles north of Alamos, Sonora, topotypes of *Natalus mexicanus saturatus* differ as follows: maxillary tooth-row longer; color darker; in red phase, near

(14 j) Amber Brown to between Burnt Sienna and Chestnut instead of Cinnamon Buff to between Yellow Ocher and Cadmium Yellow; in "gray" phase near (h) Clay Color instead of grayish to Avellaneous.

Remarks.—*Natalus mexicanus* has been recorded from Central America but by us no specimens have been examined from areas south of Mexico. Consequently we do not know the southern extent of the geographic range of the subspecies here newly named; we suppose that *N. m. saturatus* is the name applicable to *Natalus mexicanus* of Central America although the possibility is recognized that an unnamed subspecies occurs there.

Among specimens from the type locality of *N. m. saturatus*, the palest individual in the red phase is darker than the darkest individual in that phase from Baja California and Sonora. The one topotype of *N. m. saturatus* in the gray phase likewise is darker than any animals in the corresponding color phase from Baja California and Sonora. Intergradation is indicated by the intermediacy in color of a specimen in the United States National Museum from Mojaráchie, Chihuahua. In other features this specimen agrees with *N. m. mexicanus*. Seven specimens in the U. S. National Museum from Rosario, Sinaloa, and one from Itzatlan, Jalisco, are like *N. m. mexicanus* in length of tooth-row, length of skull, and contour of posterior part of roof of braincase. Only in color do they show some, but slight, approach to the darker *N. m. saturatus*. Finally, the specimen from eight kilometers northeast of Antiguo Morelos is slightly lighter than topotypes of *N. m. saturatus* and therein could be thought of as showing some approach to *N. m. mexicanus*. In other features, however, this specimen agrees with *N. m. saturatus*.

Natalus mexicanus saturatus, here newly named, is a strongly marked geographic race especially as regards color. It is noteworthy that of the 59 skins examined from the state of Veracruz (see below) only one (K. U. no. 17845) is in the gray phase; all the others are in the red phase.

Acknowledgment is made of assistance from the Kansas University Endowment Association with the field work which yielded the series of specimens from Sonora and from Veracruz. We are grateful to those persons in charge of the collections of the United States National Museum, the Biological Surveys Collection, and the Museum of Vertebrate Zoology for lending us comparative materials.

Measurements.—Average and extreme measurements, in millimeters, of ten adult females from the type locality, are as follows: Total length, 99(96-105); length of tail, 49.6(47-52); ear from notch, 15.1(13-16); greatest length of skull, 16.2(16.0-16.6); zygomatic breadth, 8.3(8.1-8.4); interorbital constriction, 3.2(3.1-3.2); breadth of braincase, 7.7(7.6-7.9); maxillary tooth-row (including canine, 6.9(6.7-7.0); breadth across last upper molars, 5.3(5.1-5.3).

Specimens examined (Unless otherwise indicated in the Univ. Kansas Mus. Nat. Hist.).—Total number, 93, distributed by localities as follows: *San Luis Potosí*: 8 km. NE Antiguo Morelos, 500 ft., 1. *Veracruz*: San Andreas Tuxtla, 1(U. S. Nat. Mus.); 3 km. E San Andreas Tuxtla, 88(including 10 skeletons and 20 alcoholics). *Campeche*: Apazote, 1(U. S. Nat. Mus.); La Tuxpena, 2(U. S. Nat. Mus.).

Museum of Natural History, University of Kansas, Lawrence, Kansas. December 9, 1948.

PROCEEDINGS
OF THE
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TWO NEW ORIOLES FROM THE PHILIPPINES

By E. T. GILLIARD

During current studies of Philippine birds based on large comparative collections recently obtained by a joint expedition of the American Museum of Natural History and the National Museum of the Philippines to the peninsula of Bataan, two new races of *Oriolus chinensis* were found and the validity of a third form substantiated.

I am greatly indebted to Dr. Ernst Mayr who has read the manuscript for many valuable suggestions.

An examination of 130 Black-naped Orioles from the islands of Fuga, Luzon, Mindoro, Samar, Negros, Mindanao, Basilan and the Sulus reveals the existence of five well-marked races, two of which remain to be named. Racial characters are predicated on depth of yellow forehead, degree of yellow on primary coverts and inner secondary tips, and, to a minor degree, on size. Generally speaking, the yellow forehead becomes narrower (with consequent increase in width of black nape band), and the yellow tips of the primary coverts and inner secondaries decrease to the point of obsolescence from north to south (N. Luzon to Basilan Island). In dimensions the species tends to become larger than average in Northern Luzon, extreme Southern Luzon and in the Sulu Islands. Distinct racial populations inhabiting north-central Luzon in the north and the Mindanao-Basilan area in the south are about equal in size.

Adult males and females are bright yellow. Meinertzhagen's observation (Ibis, 1923:72) that adult females have "back green, not yellow, central rectrices green, not black," applies to subadult females and immature males. Sexual dimorphism, as noted for this species in the Philippines, is restricted to a slight mean difference in size, the females being smaller.

Oriolus c. chinensis Linnaeus. Black-naped Oriole

Oriolus chinensis Linn. Syst. Nat. 12th ed. i. 1766, p. 160: China (error), Cochinchina (ex. Brisson) = Manila, Meinertzhagen, (Ibis, 1923, p. 72).

In assigning a precise type locality to this race Meinertzhagen (1923: 72) writes: "... the name *chinensis* is clearly applicable to one member of this group, which induces me to accept it for the Philippine bird, to which the description and plate most closely agree. In the days of Brisson, type-localities were very vague and the Philippines might easily

be held to be covered by the general term China. As the type locality of *chinensis*, I cite Manila."

Adult examples in the American Museum of Natural History from the vicinity of Manila (1 ♂, San Mateo; 1 ♂ San Juan, Laguna de Bai; 5 ♂ ♂, 4 ♀ ♀, Lamao, Bataan) agree well together. However, they are quite different from a long series of specimens from Sorsogon, extreme southern Luzon, and from a single specimen from Fuga island off the northern tip of Luzon, both of which are described below. In fact, the characters distinguishing each of the three races are sufficiently vivid to permit accurate field identification.

Oriolus chinensis fugaensis new subspecies

Type: No. 670475. American Museum of Natural History (Rothschild Collection). ♀ ad. Fuga Island, off the coast of northern Luzon, Philippine Islands, April 15, 1895. Whitehead Collection.

Diagnosis: Nearest to *chinensis* but differing by reason of much more extensive yellow forehead patch and longer wings (see table of measurements). In *chinensis* the forehead patch is never more than 23 mm. in depth, terminating on the center-line of the crown just behind the eyes. In *fugaensis* the patch is 30 mm. deep terminating on the occiput.

Measurements of type: Wing 159 mm.; tail 104; bill from anterior edge of nostril 25; tarsus 29.

Range: Known only from the type locality.

MEASUREMENTS

<i>fugaensis</i>	Wing	Tail	Bill
1 ♀ Fuga Island	159	104	25
<i>chinensis</i>			
3 ♀ ♀ Lamao, Bataan	148-154	96.5-100	24-25
5 ♂ ♂ Lamao, Bataan	151.5-155	98.5-105	24-26
1 ♂ San Mateo, N. of Manila	154	101	
1 ♂ San Juan, E. of Manila	156	102.5	25
<i>sorsogonensis</i>			
7 ♂ ♂ Sorsogon	156-164	102-111	24.5-26.5
6 ♀ ♀ Sorsogon	149-157.5	98-104	24.5-26
5 ♂ ♂ Tayabas	154.5-159	103.5-106.5	24.5-26
2 ♀ ♀ Tayabas	154	103-105	24.3-27
4 ♂ ♂ Mindoro Island	155-160	103-105	25-27
<i>nomamuræ</i>			
1 ♂ Samar Island	158	102	26.5
1 ♀ Negros Island	157	108	25
5 ♂ ♂ Mindanao Island	153-156.5	100-106	25-28
2 ♂ ♂ Basilan Island	154-155	101-105	25-27
<i>suluensis</i>			
3 ♂ ♂ Sulu Islands	148-156.5	111-118	25-26

It is remarkable that the population of *chinensis* inhabiting the southernmost portion of Luzon should differ from birds living about Manila. Perhaps an explanation is to be found in the fact that the species *chinensis* thrives in the semi-open lowlands and is restricted both by

forested hills of moderate height and by belts of original tropical jungle. In this connection it is pertinent to note that a series from Infanta, on the eastern coast of Luzon at approximately the same latitude as that of Manila, which lies on the western coast, is closely similar to the southern Luzon race, now to be described:

Oriolus chinensis sorsogonensis, new subspecies

Type: No. 94316. American Museum of Natural History. ♂ ad. Sorsogon, southern Luzon, Philippine Islands. March 22, 1903. Collected by Dr. E. H. Porter.

Diagnosis: Similar to *chinensis* but with a much narrower yellow forehead and perceptibly larger wings and tail (see table of measurements). The yellow forehead patch is never more than 16 mm. deep with a maximal terminal point on the mid-crown between the eyes.

Measurements of the Type: Wing 159.5 mm.; tail 106; bill from anterior edge of nostril 26; tarsus 29.5.

Range: Southern Camarines province, Luzon. A series from northern Camarines (Tayabas) contains a few intermediates but in general is more closely related to *sorsogonensis*. This is true of 4 Mindoro ♂ ♂ which agree in size with Sorsogon ♂ ♂ but have somewhat larger yellow forehead patches, as observed in the series of ♂ ♂ from Tayabas. This race probably ranges to the islands of the Sibuyan Sea. One Samar island ♂ before me is intermediate between *sorsogonensis* and *yamamurae* but closer to the latter. It agrees with Sorsogon birds in size and depth of yellow forehead but retains the distinct black wings of the southern form.

Oriolus chinensis yamamurae Kuroda

Oriolus chinensis yamamurae Kuroda, 1927. *Tori*, vol. 5, no. 23, p. 257, (Basilan Island).

Five ♂ ♂ from Mindanao and 2 ♂ ♂ from Basilan Island are similar. Together they differ considerably from all other Philippine races by having wings black without yellow tipping on primary coverts and inner secondaries. Although described as differing from the nominate form mainly by smaller size, there is no appreciable difference, as pointed out by Mayr in Delacour and Mayr, 1945: *Zoologica*, Vol. 30, pt. 3, Nov. 15, 1945, p. 117).

In coloration *yamamurae* is similar to *suluensis* from which it differs by reason of a much shorter tail. It differs from the nominate form by having a much narrower forehead patch (not exceeding 12.5 mm. in depth) and, in this respect, is but slightly smaller than *sorsogonensis* which has the forehead patch not exceeding 16 mm.

Range: Mindanao and Basilan Islands. Also Samar? and Negros?

Remarks: A single Negros Island ♀ before me is slightly larger (wing and tail) than any in the Mindanao-Basilan series, but otherwise it is similar.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

SOME OBSCURE APHID SPECIES

F. C. HOTTES

Aphid taxonomists lacking a catalogue of the Aphididae of the world have come to rely on such excellent species and food plant lists as those published by Davidson, Patch and Wilson, for checking older literature for aphid specific names. It is the purpose of this paper to add some specific names not listed in these works and to recognize a species heretofore considered a *nomen nudum*.

In 1814, in his usual brief and unsatisfactory manner Rafinesque described two aphid species which he placed in the genus *Aphis*. The only reference to this early work by Rafinesque in Aphid literature I am aware of, is found in a foot note on page 25 of the 1860 publication of Passerini. Without mentioning the species by name, Passerini rejects them, as must we because of the poor descriptions. The names however should become a part of aphid literature so as to prevent their being reused within the genus *Aphis*. The species are *Aphis striata* Raf. 1814 and *Aphis montana* Raf. 1814. *Aphis montana* is described as having the antennae bent which is not a characteristic of the family Aphididae, and one might question the species belonging to the family except for the mention of the cornicles as "2 pointes noires."

In 1818 Menke described briefly in both German and Latin a new species belonging to the genus *Aphis* to which he gave the name *versicolor*. He had collected the species on the leaves of "Hainbuchen" (Hornbeam). Hagen credits *Aphis versicolor* to Menke but mentions only the second edition which was not published till 1840. The species appears to be a *nomen nudum* I find no dark species as having been described from the host mentioned.

In British Entomology Volume XII part 577, under number 27 but not a part thereof, Curtis described as new *Cinara symphiti*. The only mention of this species known to me was called to my attention by Dr. Frederick Laing of the British Museum. It is that of Walker who considers *symphiti* to be a synonym of *Aphis costata* Zetterstedt. This is most likely correct but one wishes the description by Curtis of the antennae and legs agreed as well as the description of the wings with the published descriptions of *costata*. The type apparently is not in the Curtis collection which is now in the British Museum.

The name *Aphis limoni* Contarini 1847 occurs a number of times in Aphid literature but is not mentioned by Davidson, Patch or Wilson. The species was described by Contarini in the second volume of Venezia E Le Lagune on page 190. This work is exceedingly rare. I have been informed that the four insects described in it are not mentioned in Oshanin's Catalogue, nor did Sherborn include them in his Index Animalium. Disconzi in 1865 mentions the species and briefly describes it. F. Schumacher, 1918 mentions this species in connection with a work published in 1843 apparently in error, and quotes the original description in full as published in 1847. Lambers, 1939 considers *Aphis limoni* Contarini to belong to the genus *Staticobium* Mordvilko and lists *Aphis limoni* Walker as a synonym. One may question the validity of this synonymy but to do so one must place considerable stress on the differences in color, Walkers species being described as green of various shades by Theobald, as dirty green or dirty reddish by Lambers. Conta-

rini describes his species as "È di un color rosso carico di sangue o pavonazzo." The species described by Walker is a homonym of the species described by Contarini and if not a synonym the next available name is that of *Macrosiphoniella staticis* Theobald.

In his 1887 work Oestlund names a "pale red or pinkish" aphid taken on the roots of *Trifolium repens*, *Aphis trifolii*. There is no formal description of the species nor are specimens in the Oestlund collection of the University of Minnesota, of this date under this name. One would be inclined to consider this species a nomen nudum where it not for the fact that Davis, 1908 in a discussion of *Aphis bakeri* Cowen mentions sending specimens determined as *trifolii* to Oestlund and of his reply as follows: He believed the specimens to be the same species described by him some twenty years ago and named *Aphis trifolii*; though he had never seen the adult form before, either spuriae or migrants and his original description was based only on the larvæ. The Davis slides remain in the Oestlund collection and it is from these that a new lectotype for the species should be selected.

It is true that Oestlund described *trifolii* as a subterranean species and one feeding on the roots which is not true of *Aphis bakeri*. It is obvious however that Oestlund was not the original collector and thus relied on the uncritical observations of another, who may have taken the shed-like structures often constructed by ants over the basal parts of the stems and crown of the plant for the surface of the soil.

Despite the fact that there is almost no possibility of supporting the contention that *Aphis bakeri* Cowen is a synonym of *Aphis trifolii* Oestlund on the presence of preserved specimens, on the basis of the entire agreement as to color and on Oestlunds statement to Davis that he believed specimens sent him by Davis to be the species described by him as *trifolii* *Aphis bakeri* Cowen is declared a synonym of *Aphis trifolii* Oestlund.

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PROCEEDINGS
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AN ADDITIONAL FORM OF THE SOUTH AMERICAN
GRASSHOPPER SPARROW

BY ALEXANDER WETMORE

A recent check on the forms of the South American Grasshopper Sparrow, *Myospiza humeralis* has brought to attention a very distinct subspecies, hitherto unrecognized, in collections made in the arid Guajira Peninsula of northeastern Colombia and northwestern Venezuela. The new form may be known as

Myospiza humeralis pallidula, subsp. nov.

Characters: Similar to *Myospiza humeralis humeralis* (Bosc)¹ but decidedly paler above, with the dark streaking much reduced both on back and crown, the brown edgings more extensive and lighter in color, and the gray tones lighter; sides and flanks paler; definitely lighter colored than any of the other known races.

Description: Type, U. S. Nat. Mus. No. 370,276, male adult, from Maicao, Guajira, Colombia, taken April 14, 1941, by A. Wetmore and M. A. Carriker, Jr. (orig. no. 11,385). Center of crown pale smoke gray, bordered on either side by broad darker bands where the feather centers are dull black bordered narrowly with pale smoke gray anteriorly, the paler border replaced posteriorly by edgings of sayal brown that become progressively broader, until at the level of the center of the crown they largely replace the black; superciliary line from base of bill to about center of eye wax yellow, changing then to pale smoke gray; hindneck, back and rump sayal brown, with edgings of pale smoke gray; middle of back with restricted median dull black streaks; rump and upper tail-coverts wood brown, with slightly paler edgings and concealed darker shaft streaks; bend of wing empire yellow, changing to pale lemon yellow beneath the alula; primaries and secondaries fuscous; wing-coverts vinaceous-buff changing externally to tilleul-buff, with concealed portions dull black; primary coverts fuscous, edged lightly with vinaceous-buff; primaries edged narrowly with tilleul-buff; secondaries bordered broadly with sayal brown, this edging changing distally to tilleul-buff; rectrices fuscous, edged narrowly with tilleul-buff, and tipped indistinctly with dull vinaceous-buff; lores and space around eye dull grayish white; cheeks light grayish olive, with a narrow post-ocular streak of sayal brown; throat, lower breast and abdomen dull white; upper breast and sides dull light buff; flanks and under tail-coverts dull pinkish buff; under wing-coverts white; inner webs of primaries toward base vinaceous-buff as seen from underneath. Maxilla fuscous-black, mandible light drab; tarsus and toes wood brown (from dried skin).

Measurements: Male, type, wing 58.2, tail 48.0, culmen from base 11.4, tarsus 19.2 mm.

Females (2 specimens), wing 56.0-56.7, tail 44.1-44.4, culmen from base 11.7-11.9, tarsus 19.3-19.8 mm.

Range: The Guajira Peninsula, where recorded at Maicao, Puerto

¹*Tanagra humeralis* Bosc, Journ. Hist. Nat. (Choix des Mém.), vol. 2, no. 17, September 1, 1792, p. 179, pl. 34, fig. 4. (Cayenne.).

López and Puerto Estrella, Colombia, and at Paraguaipoa, Zulia, Venezuela.

Remarks: In the vast range of *Myospiza humeralis*, from Colombia and Venezuela south to northern Patagonia, there is considerable individual variation within comparatively narrow limits, but except for the new form here described, relatively slight differences that can be correlated with geographic distribution as a basis to separate subspecies. One of the principal individual variants, found mainly in *M. h. humeralis*, is an occasional example of a slightly rufescent phase. The more northwestern birds in northern Colombia are darker, and are recognized as the subspecies *columbiana*. The more southern ones are grayer and are separable as *xanthornus*. The race *tarijensis*, which is not available to me at the moment, as said to resemble *xanthornus* but to differ in slightly larger size. Other names that have been proposed fall as synonyms.

It has been a matter of note therefor to find that the Guajira birds are set apart from all others, completely and definitely, by their decidedly paler coloration. This is especially remarkable when it is recalled that many regions in the far south inhabited by these birds are equally arid. While Carriker and I prepared only three specimens, these differ so radically from all others seen that I have no hesitance in describing them as a new form. In fact I find that I noted in my journals their pale color when seen in life. The three that we secured come from Maicao and Puerto López where the birds were fairly common. Others were seen at Puerto Estrella to the north of the point last mentioned.

W. H. Phelps, Jr., has kindly compared for me two males in the Phelps Collection from Paraguaipoa in the Venezuelan section of the Guajira Peninsula, his observations demonstrating that these two birds are *pallidula* as indicated by their paler color. This point is probably near the southern limit of the race.

PROCEEDINGS
OF THE
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A NEW HARVEST MOUSE FROM MICHOACAN,
MEXICO

BY E. RAYMOND HALL and BERNARDO VILLA R.

In preparing a check-list of the mammals of the state of Michoacan we have had occasion to identify some harvest mice of the species *Reithrodontomys chrysopsis*, which species lives mostly on the upper slopes of the higher volcanoes of the southern edge of the table land of Mexico. In 1914 when Howell (N. Amer. Fauna No. 36) revised the genus *Reithrodontomys*, he had a total of only 27 specimens of the species *R. chrysopsis*. Twenty-five of these, including 7 from Mount Tancitaro, in Michoacán, he referred to the subspecies *R. c. chrysopsis*. From this westernmost record station of occurrence, J. S. Candy in 1940, and F. C. Wonder in 1941, obtained in all 22 specimens at elevations of 6000 to 11000 feet. This series shows well the variation with age and reveals, in comparison with topotypes of *Reithrodontomys chrysopsis chrysopsis* Merriam, from Mount Popocatepetl, that the animals on Mount Tancitaro pertain to an heretofore unnamed subspecies which may be characterized and named as follows:

***Reithrodontomys chrysopsis seclusus*, new subspecies**

Type.—Male, adult, skin and skull; no. 52114 Chicago Nat. Hist. Mus. (4th Hoogstrool Mexican Biol. Expedition); Mount Tancitaro, 7800 ft., Michoacán, Mexico; June 30, 1941; obtained by F. C. Wonder, original no. 1036.

Range.—Mount Tancitaro, Michoacán, 6000 to 11000 feet or higher.

Diagnosis.—Size small (see measurements); color near (14'j) Cinnamon-Brown (color terms after Ridgway, Color Standards and Color Nomenclature, Washington, D. C., 1912) on upper parts and sides; overlaid with blackish on back; in some specimens suggestion of Ochraceous-Tawny lateral line; braincase globular; upper molars with accessory cusps between main cusps.

Comparison.—From three January-taken topotypes of *R. c. chrysopsis*, *seclusus* differs as follows: Body, hind foot and ear shorter; color everywhere darker red, that is to say, nearer Cinnamon-Brown than Ochraceous-Tawny; skull averaging larger in every measurement taken except least interorbital constriction which is more; consistently smaller in basilar length, mastoid breadth, alveolar length of upper molar tooth-

row and postpalatal length. Specimens of equal age, as judged by amount of wear on the first upper molar, were used in comparisons; the differences, therefore, are not ascribable to age.

Remarks.—Our topotypes of *R. c. chrysopsis* are in full winter (January) pelage whereas all the specimens of *R. c. seclusus* were taken in June and July. Therefore, the differences in color mentioned above may be of seasonal rather than geographic significance. The pelage of *seclusus* is the shorter and its tail is less heavily haired. The ears of *R. c. chrysopsis* are blackish whereas those of *seclusus* are reddish, and we doubt that this difference is seasonal. However this may be, the lesser size and cranial differences serve fully to permit of differentiating *seclusus* from *R. c. chrysopsis*. We have no specimens available of *R. c. tolucae*, *R. c. perotensis* or *R. c. orizabe* but of these subspecies, *tolucae* and *perotensis* are lighter-colored (instead of markedly darker) than *chrysopsis*, and *orizabe* was said in the original description to be of the same color as *chrysopsis*, but by Davis (Journ. Mamm., 25:394, 1944) to be a synonym of *R. c. perotensis*. *R. c. seclusus*, therefore, is the darkest of the four geographic races which now are recognized.

We thank Messrs. Karl P. Schmidt and Colin C. Sanborn of the Chicago Natural History Museum for the opportunity to study the specimens from Tancítaro, are grateful to the University of Kansas Endowment Association for funds supporting the field work which was productive of the topotypes of *R. c. chrysopsis*, and to the Comisión Impulsora y Coordinadora de la Investigación Científica for assistance with the investigation of Mexican mammals.

Measurements, in millimeters, of topotypes of two subspecies of
Reithrodontomys chrysopsis

Number	Museum	Sex	Age	Total length	Length of tail	Length of hind foot (dry)	Length of ear from notch (dry)	Basilar length	Mastoid breadth	Interorbital constriction	Alveolar length of maxillary tooth-row	Postpalatal length
<i>R. c. seclusus</i> , Mt. Tancítaro, 7800 ft.												
51411	Chi.M.	♂	ad.	173	98	19.5	15.9	17.3	10.4	3.3	3.5	7.5
52114	Chi.M.	♂	ad.	173	100	19.1	14.1	17.0	10.5	3.3	3.6	7.3
52115	Chi.M.	♂	ad.	170	84	19.2	14.1	17.0	10.5	3.3	3.8	7.3
<i>R. c. chrysopsis</i> , Popocatepetl, 3450 mts.												
1681	B.V.R.	♂	ad.	173	95	19.9	17.5	17.8	10.8	3.1	3.9	7.9
1688	B.V.R.	♀	ad.	182	94	20.0	17.5	17.8	10.9	3.1	4.0	7.9
1684	B.V.R.	♀	s.ad.	185	—	21.0	16.0	18.0	10.8	3.2	4.0	7.9
17980	K.u.	♀	ad.	189	107	20.0	19.0	18.0	10.7	3.2	3.9	8.2

Specimens examined.—Twenty-two, all from Mount Tancítaro, Michoacán, distributed by altitude as follows: 6000 ft., 5; 7800 ft., 10; 10500 ft., 1; 11000 ft., 1; no altitude recorded on label, 5.

Contribution from the Instituto de Biología de la Universidad de México and the Museum of Natural History of the University of Kansas.

Transmitted August 9, 1949.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW *TRIMETOPON* (OPHIDIA) FROM GUATEMALA

BY L. C. STUART

Laboratory of Vertebrate Biology, University of Michigan

During the course of investigating the herpetofauna of the southwestern highlands of Guatemala in 1947, the writer had the opportunity to spend some ten days at a coffee *finca* on the Pacific slopes. While raking in the mulch that accumulates in the coffee groves, I encountered, along with *Rhadinaea lachrymans*, *Ninia s. scbae*, *Geophis nasalis*, and *Adelphicos q. sargii*, a small snake which appears to be new to science, and may be assigned tentatively to the genus *Trimetopon* Cope.

As investigations into the nature and composition of the Middle American ophidian groups allied to the genus *Rhadinaea* Cope have progressed, the genus *Trimetopon* has become increasingly difficult of definition. Originally diagnosed as possessing a single prefrontal and a reduced number of dorsal scale rows (15), the genus has been redefined to include species with two prefrontals and 17 scale rows. Dunn¹ essayed a redescription of the group on the basis of the four species known to him at the time. Since then two *Trimetopons* have been named and in this paper I add another two. As the genus now stands, therefore, it cannot be differentiated from *Rhadinaea*, though it is possible that a reexamination of all material may reveal some hemipenial or tooth character by which the genus may be defined. In the opinion of the writer, however, the genus represents an unnatural group of species which appear to have had independent origins, in part at least, from several *Rhadinaean* ancestors, or, rather, *Rhadinaean*-like prototypes.

Notwithstanding, the writer believes that, on the basis of our present knowledge, the genus is of value. In assembling under it a group of forms which in morphological characters and habits show some similarity and which would, for the present, confuse rather than clarify the nature of some other genus into which they might be forced, *Trimetopon* is worthy of recognition if its possible shortcomings are kept in mind. For my good friend and hospitable host, Señor don Walter Hannstein of Finca La Paz and Panajachel, I am, therefore, pleased to name

Trimetopon hannsteini new species

Holotype.—University of Michigan, Museum of Zoology No. 98756. An adult male collected at Finca La Paz (18 kilometers [straight line]

¹Dunn, E. R., "New or Unnamed Snakes from Costa Rica." *Copeia*, 4, 1937: 214-15.

due north of Coatepeque), Department of San Marcos, Guatemala, May 14, 1947. Elevation, 1,450 meters.

Paratypes.—University of Michigan, Museum of Zoology Nos. 98753-55, 98757. Collected with the holotype.

Diagnosis.—A small snake differing from all other species currently included in *Trimetopon* in possessing two prefrontals (eliminates *gracile* and *simile*), 17 dorsal scale rows (eliminates *barbouri*), eight supralabials (eliminates *posadasi*, *slevini*, and *viquezi*), and a single postocular (eliminates *veraepacis*, discussed below).

Description of holotype.—A full colubrine complement of normal head scutes. Rostral broader than high; visible from above. Two internasals; broader than long and only about one-half as long as the paired prefrontals. Frontal pentagonal; longer than its distance from the tip of the snout. Supraoculars long and narrow; equal in length to the prefrontals. Nostril between two nasals. Loreal slightly longer than high. One pre- and one postocular. Temporals 1 + 2. Eight supralabials, the fourth and fifth entering the eye. Eight infralabials, four in contact with the anterior chin shields which are longer than the posterior ones. Eleven slender teeth on the maxilla; increasing in size posteriorly. These followed by a diastema (?) behind which lie two stout, slightly enlarged teeth. Dorsal scales without apical pits, in 17 longitudinal rows throughout the body length. Abdominals 147; pre-anal divided; subcaudals 70. Supra-anal scales with low, but definite keels. Body length, 232 mm.; tail length, 92 mm.

The hemipenis of the species is short, extending only to the sixth subcaudal in the inverted position. In contrast to Cope's figure² of that of *T. pliolepis* (= *gracile*) which is colubrine in structure, the hemipenis of *T. hannsteini* is typically xenodontine with a divided sulcus spermaticus, slightly bifurcate distally, and capitate or at least moderately so. The sulcus lies on the medial side of the organ and originates occasionally as two grooves which join as the calyculate portion of the hemipenis takes form, and bifurcates about halfway up the length of the organ. The medial side of the hemipenis, except for one or two large spines flanking the sulcus at its base, is entirely calyculate. The lateral side, except at the very tip, is spinous. On this latter side there are two large basal hooks concealing two smaller ones. Above these basal hooks are two patches of small spines separated by a naked area. Proximally these spines are scattered or arranged into three irregular rows which merge into a single row distally where the spines become shorter and more slender. Each spinous patch is comprised of about 25 individual spines.

Inasmuch as the color of the holotype is somewhat darker than that of the paratypes, its pattern is difficult to discern. The top and sides of the head are dark brown minutely flecked with lighter shades; each supralabial with an irregular white spot. The lower jaw is cream-color heavily dusted with brown on the infralabials. There is a trace of a white collar on the nape which is definitely apparent only ventro-laterally and is merely indicated dorsally by light spots. Ground color of the dorsum dark brown flecked with lighter shades. There are nine longitudinal stripes on the dorsum which are produced by a darkening of certain portions of the various scale rows, and which are disposed as follows:

²Cope, E. D., "The Classification of the Ophidia," Trans. Amer. Philos. Soc., 18, 1895: Pl. 20, Fig. 1.

lateral edges of the abdominals and the ventral one-quarter of scale row one; dorsal one-half of scale row one and ventral one-half of scale row two; dorsal one-half of scale row three and ventral one-half of scale row four; dorsal one-half of scale row five, all of scale row six (except for light flecks on its center) and the ventral one-half of scale row seven; center one-half of the vertebral scale row. Undersurfaces of tail and body, except for the edges of the abdominals, immaculate cream-color.

Variation.—The paratypes are like the holotype in all essential features. Ventral scutellation varies as follows:

Number	Sex	Abdominals	Subcaudals
98755	♂	144	broken
98753	♂	141	72
98754	♀	150	63
98757	♀ Juv.	153	66

Of the nature of the maxillary dentition of this species I cannot be certain. In Nos. 98754 and 98756 there appears to be a diastema, though this may be a space left by a shed tooth. In Nos. 98753 and 98755 there is no indication of a diastema. In all the specimens the last two or three teeth are stouter than the others. The total tooth count varies 10-13.

The only other variability in the type series worthy of note is the color. The holotype is by far the darkest of the lot. The pattern of the paratypes is, therefore, more apparent than in the holotype, especially the white collar.

Comments.—I have previously noted that a species described by Stuart and Bailey³ under the name of *Rhadinaea veraepacis* might better be allocated to the genus *Trimetopon*. I take this step at the moment because in its general features the species is very similar to others assigned to this same genus. It was noted in the original description that *veraepacis* was something of a waif in the *Rhadinaea* picture. It is, however, not very different from *hannsteini* and may well be related to it. Dunn⁴ has already suggested a *barbouri-viquezi-slevini* chain. Thus three very definite groups might be sorted out in the genus as now constituted. Based upon a very little material personally examined and upon the literature⁵ relating to the genus, it may be summed up as follows:

- A. A single prefrontal B
 B. Ventrals 151-154 *gracile*
 BB. Ventrals 122 *simile*
 AA. Two prefrontals C
 C. Dorsal scales in 15 longitudinal rows *barbouri*
 CC. Dorsal scales in 17 longitudinal rows D

³Stuart, L. C., and Joseph R. Bailey, "Three New Species of the Genus *Rhadinaea* from Guatemala." Occ. Papers Mus. Zool. Univ. Michigan, 442, 1941: 9.

⁴Dunn, E. R., "New and Noteworthy Herpetological Material from Panama." Proc. Acad. Nat. Sci. Phila., 92, 1940: 118.

⁵Dunn, E. R., "New Snakes from Costa Rica and Panama." Occ. Papers Boston Soc. Nat. Hist., 5, 1930: 330-32.

Dunn, *op. cit.*, 1937 and 1940.

Slevin, Joseph R., "A New Central American Snake." Proc. Cal. Acad. Sci., 23 (4), 1936: 79-81.

Stuart and Bailey, *op. cit.*

D. Seven supralabials	E
E. A single postocular	<i>posadasi</i>
EE. Two postoculars	F
F. Paired light spots on nape; no dark stripe on scale row 4	<i>slevini</i>
FF. No light nape spots; a dark stripe on scale row 4	<i>viquezi</i>
DD. Eight supralabials	G
G. A single postocular	<i>hannsteini</i>
GG. Two postoculars	<i>veraepacis</i>

Acknowledgements.—For their courtesy in submitting their opinions on the species described herein, I wish to thank Dr. Joseph R. Bailey of Duke University and Dr. E. R. Dunn of Haverford College.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SUBSPECIES OF HARVEST MOUSE
(*REITHRODONTOMYS*) FROM CENTRAL AMERICA

BY EMMET T. HOOPER

University of Michigan Museum of Zoology

The excellent series of specimens of harvest mice obtained in El Salvador by R. A. Stirton and associates at the University of California makes possible clear appraisal of variation in the species *Reithrodontomys mexicanus* in that part of Central America. To judge from those specimens, several populations of *R. mexicanus* in El Salvador differ from one another in external and cranial features. Each is partly or completely isolated by inhospitable terrain. As now sampled, however, none alone appears to be sufficiently unique to warrant recognition by name, for reasons that will be given in a detailed treatment of the genus now in preparation. Instead, by reason of morphological features common to all, in contrast to those of other populations of *R. mexicanus*, they may be considered conveniently as comprising one geographic race, which may be known as

***Reithrodontomys mexicanus orinus*, new subspecies**

Type.—Adult male, skin and skull, No. 98459, Univ. Calif. Mus. Vert. Zool.; El Salvador, Dept. Sonsonate, about 12 miles southeast of Sonsonate, near summit of Balsam Range, Hacienda Chilata, elevation 2,000 feet; collected 12 May 1942 by M. Hildebrand; original No. 1465.

Distribution.—Mountain slopes of El Salvador and of southeastern Guatemala. Known range from San Rafael and Lago de Amatitlan, Guatemala, southeast in the coastal chain of volcanoes to the Balsam Range, El Salvador, and southeast on the southern flanks of the interior highlands of El Salvador as far as Cerro Cacaguatique. Vertical range from 2,000 feet at Hacienda Chilata to 6,400 feet on Los Esesmiles, El Salvador.

Characters and Comparisons.—Upper parts Ochraceous-Tawny or Tawny (Ridgway, Color Standards and Color Nomenclature, 1912), the tawny bands of the underfur but slightly obscured by the black bands of the comparatively few guard hairs. Underparts white or creamy white, the hairs Dark Plumbeous basally, except on throat where they are white throughout. A blackish eye ring. Ears Cinnamon-Drab to Fuscous. A longitudinal, Fuscous stripe of varying width and length on the upper surface of each forefoot and hind foot, the remainder of the

upper surface white. Tail Fuscous, and monocolored or slightly paler ventrally. Skull of moderate size (for the species) with shallow brain case, long rostrum and incisive foramina, small molar teeth, and small auditory bullae.

R. m. orinus resembles *R. m. lucifrons* in body size, and both races are characterized by bright tawny coloration, which in full adult pelage compares favorably with that of *Peromyscus nuttalli aureolus*. The upper parts of the race *orinus*, however, average paler and the underparts are usually white, rather than Light Pinkish Cinnamon as in *lucifrons*. Cranially, *orinus* differs from *lucifrons* as follows: shallower brain case; relatively¹ longer rostrum (averages 91 per cent of brain case depth in *orinus* and 87 per cent in *lucifrons*); shorter palate; longer incisive foramina (average 50 per cent of brain case depth, compared with 47 per cent in *lucifrons*); and smaller auditory bullae.

From *howelli*, *orinus* differs in larger size, paler upper parts (the orange bands similar in hue but the black bands more abundant), relatively broader zygomatics, narrower and longer rostrum, longer palate, and smaller auditory bullae.

Compared with *orinus*, *ocotepequensis* is smaller and much darker dorsally; it has a shorter tail and smaller skull, with relatively smaller brain case, narrower zygomatics and larger auditory bullae.

Measurements.—Averages and extremes, in millimeters, of six adult topotypes: total length, 181 (175-187); tail vertebrae, 108 (100-126); hind foot, 19 (18-21). Greatest length of skull, 23.1 (22.6-23.4); zygomatic breadth, 12.0 (11.5-12.6); breadth of brain case, 11.0 (10.7-11.4); depth of brain case, 8.6 (8.2-8.9); interorbital breadth, 3.6 (3.4-3.7); breadth of rostrum, 4.2 (3.9-4.3); length of rostrum (from notch, near lacrimal, on anterior inner border of zygomatic arch anteriorly to tip of nasal), 8.3 (8.0-8.8); length of hard palate, 3.4 (3.2-3.5); length of incisive foramen, 4.3 (4.1-4.6); alveolar length of molar row, 3.2 (3.2-3.3); least transverse breadth of zygomatic plate, 1.6 (1.4-1.7); breadth of mesopterygoid fossa, 1.5 (1.4-1.8)

Remarks.—*R. m. orinus* lives in comparatively arid parts of El Salvador and southeastern Guatemala. The diagnostic characters of the race apparently are best developed in southwestern El Salvador, as indicated by specimens from Hacienda Chilata and Volcán de Santa Ana. Those from Chilata are the palest and have the most distinctive crania: relatively broad zygomatics; shallow, posteriorly depressed brain case; long rostrum and incisive foramina; slight molar teeth, and small auditory bullae. The examples from Volcán de Santa Ana have larger molars and average slightly darker dorsally, but are otherwise similar. Away from those two localities, to the north (Los Esesmiles), east (Cerro Cacaguatique) and northwest (San Rafael and Lago de Amatitlan), the pelage color averages slightly darker, the cranium deeper, and the rostrum shorter.

Specimens examined.—A total of 50 from the following localities:

EL SALVADOR: Dept. Chalatenango: Los Esesmiles, 6,400 ft., 12. Depts. Morazan and San Miguel: Cerro Cacaguatique, 3,500-4,800 ft., 22. Dept. Sonsonate: Hacienda Chilata, 2,000-2,600 ft., 7; Volcán de Santa Ana, 4,500-5,000 ft., 4.

¹In these comparisons the term "relatively" implies: with respect to depth of brain case.

GUATEMALA: Dept. Guatemala: Lago de Amatitlan, 4,200 ft., 4;
San Rafael, 5,000 ft., 1.

(The above-listed specimens are from collections as follows: all from El Salvador, Museum of Vertebrate Zoology, University of California; from Amatitlan, Fish and Wildlife Service Collections of the U. S. National Museum; from San Rafael, Chicago Natural History Museum.)

PROCEEDINGS
OF THE
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A NEW RACE OF *RALLUS NIGRICANS* FROM
COLOMBIA

BY BOARDMAN CONOVER

For some time I have been aware that specimens of *Rallus nigricans* from Colombia in my collection differed from a series from Paraguay and Brazil. However, press of other work has kept me before this from making more than a superficial examination of the series. A more thorough investigation has now convinced me that the Colombian birds deserve to be named.

I wish to thank the American Museum of Natural History and the Philadelphia Academy of Natural Sciences for the loan of specimens.

Rallus nigricans caucae subsp. nov.

Type.—From Munchique, El Tambo, Cauca, Colombia, El. 5700'; No. 12471, adult female in the Conover Collection, Chicago Natural History Museum; collected May 29, 1937, by Kjell von Sneider.

Characters.—Differs from typical *nigricans* from Paraguay and Brazil by having the undersides much lighter more bluish gray. This is especially noticeable about the crissum and vent, which are inclined to be blackish in the typical race. Also the light throat patch is generally whiter and more extensive.

Description of type.—Forehead and fore part of crown dull gray; rest of upperparts, except tail, uniform olive brown; upper tail coverts and tail black; primaries and underwing coverts dark brown; throat white; sides of face, neck, chest, breast and flanks bluish gray (nearest to Deep Mouse Gray of Ridgway); crissum and vent dull gray; undertail coverts black; bill "green yellow" with darker tip; legs light brick red. Wing 125, culmen 52, tarsus 46, middle toe with claw 57 mm.

Range.—The Cauca Valley of Colombia.

Remarks.—Among the specimens examined an occasional Colombian bird approaches in the darkness of its underparts the series from Brazil and Paraguay, but some of this would seem to be due to wear. Also, one specimen from Horqueta, Paraguay is as light gray on the breast as the average Colombian example. Nevertheless, the Colombian series when compared to the Brazilian and Paraguayan specimens, is undoubtedly much lighter gray underneath.

No specimens from eastern Peru (*humilis*) were to be had for comparison. However, in the original description no mention is made of the type having lighter underparts than the typical race. Also, Dr. C. E. Hellmayr (Field Mus. Nat. Hist., Zool. Ser., 13 part 1, no. 1, p. 322,

1942) who had the opportunity of examining the type, synonymized *humilis* with typical *nigricans*, while at the same time stating that specimens from Colombia averaged slightly paler gray underneath.

Specimens examined:

Rallus nigricans nigricans.—17: Brazil (Rio Paranapanema, Sao Paulo, 1; Rolante, Rio grande do Sul, 1; Joinville, Santa Catharina, 1); Paraguay (Villa Rica, 7; Horqueta, 7).

Rallus nigricans caucae.—22: Colombia, Cauca (Timba Valle, 1; Munchique, El Tambo, 16; Popayan, 2; Rio Frio, 2); Antioquia (Medellin, (*L. l. muriei*)).

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW RACE OF PTARMIGAN IN ALASKA

BY IRA N. GABRIELSON AND FREDERICK C. LINCOLN

While working on Alaskan Willow Ptarmigan, considerable difficulty was encountered in properly assigning skins from Kodiak westward. This difficulty was intensified when six skins from the Aleutians (two from Atka and four from Unalaska) were examined. Additional skins were secured from the Museum of Vertebrate Zoology, California Academy of Science, and the Chicago Academy of Science to supplement those in the U. S. National Museum, the Fish and Wildlife Service collection, and the Gabrielson collection. These skins, where comparable in plumage, were examined and revealed an undescribed race of ptarmigan which is hereby named:

Lagopus lagopus muriei subsp. nov.

Type.—adult male (Fish and Wildlife Service coll. U.S.Nat. Mus. 366615) taken on Nagai Island in the Shumagin Islands, May 15, 1936, by O. J. Murie. This race is named for O. J. Murie in recognition of his contribution to Alaskan ornithology.

This form is distinguished from *L. l. alexandrae* which it most closely resembles by being redder and paler in the brown parts of the plumage. Birds from the Aleutians were both the reddest and palest of the group while those from Kodiak approached more closely Prince William Sound skins in comparable plumage. However, Kodiak skins both freshly collected and old specimens were more nearly like this new race. All birds used in this study were adults in breeding and post-breeding plumages.

As compared with *L. l. alascensis*, this race is much redder and darker when skins in comparable plumages are compared. *L. l. alascensis* is buffy; the new race, *muriei*, more reddish and darker, near walnut brown, while *alexandrae* is dark brown to bister.

There is no significant difference in measurements although *L. l. muriei* tends to have a more slender bill than the other races.

Only one adult female of this new race was available and no determination could therefore be made of female plumages.

Somewhat to our surprise, all birds from the Alaska peninsula were much closer to *L. l. alascensis*. Birds from Morzhovi Bay, only a few miles from False Pass, certainly belonged to *L. l. alascensis* also, while those from Unimak Island just as definitely belonged to the island group (*L. l. muriei*).

Twenty-five adult males from Atka, Unalaska, and Unimak Islands in the Aleutians, and from Unga, Nagai, Little Konaiiji, Simeonof, and Popof Islands in the Shumagins and Kodiak Island, the range ascribed to this new race, were available for comparison with seventeen *L. l. alexandrae*, and a large series of *L. l. alascensis* from the mainland included eight from the Alaska peninsula.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW SPECIES OF SALDIDAE (HEMIPTERA)
FROM WESTERN UNITED STATES

BY C. J. DRAKE AND F. C. HOTTES

The present paper contains the descriptions of two new species and notes on allied species of shore bugs from western United States. The types are in collection of C. J. Drake. Paratypes are in the collections of U. S. National Museum, Museum of Comparative Zoology (Harvard) and authors. The drawings of the right parameres were made by F. C. Hottes. *Saldula ourayi*, n. sp., is named in memory of the famous Indian Chief Ouray, who was a sincere friend of the pioneers and early settlers of the Rocky Mountain region.

Saldula andrei Drake

Saldula andrei Drake, Ark. Zool., 42B(3). 1949.

The type specimens of *S. andrei* were collected in New Mexico and Arizona. During August and September, 1937, specimens were taken by the authors in Colorado (Gateway; Telluride, Trout Lake; Palisades; Skyway; Georgetown; Delta; and Grand Junction), Utah (Green River and Logan), Idaho (Lewiston and Twin Falls), Washington (Spokane), and Wyoming (Jackson Lake), and Canada (Cranbrook, Br. Col.). The right paramere of a male from Grand Junction, Colo., is figured.

S. andrei is about the same size and shape as *S. azteca*, n. sp., but the two species may be easily separated by color as pointed out under the description of the latter. Both are largely stone- or rock-resting species and are taken only sparingly on muddy or sandy beaches near stony areas of streams and lakes. Specimens have also been collected while resting on drift wood near the edge of the water.

In markings and color pattern, *andrei* more closely resembles *S. confluenta* Say of the eastern and central states, but it is readily separated from the latter by its smaller size, slenderer form, much narrower basal portion of the hemelytra and dull corium. *S. confluenta* has a longer, paler and slenderer antennae, the second segment being longer than the next two taken together. The frontal callosities are much less swollen and tend to be brown or blackish in color. Also, the entire hemelytra tend to be shining. Both species have a vesture of long hairs.

Saldula azteca, n. sp.

Moderately large, elongate-ovate, black, clothed with nearly erect, short golden pubescence and very long, fine, erect or slightly reclining posteriorly, black hairs, the hairs larger and more conspicuous along outer

margins of pronotum and basal portion of hemelytra. Head, pronotum and scutellum deep black, shining, highly polished. Hemelytra black, velvety-like, not shining, lighter in color than pronotum; embolium deep black, shining, as dark and as highly polished as pronotum, wide, becoming wider and a little reflexed anteriorly; clavus and corium rather dull, much lighter in color than scutellum, the clavus with or without subapical pale spot; corium usually with two to four small, rounded yellowish white spots, occasionally without any spots; outer corium usually with a large subapical yellow-white spot and inner corium often with two smaller pale spots (spots variable in size); membrane fumose, subhyaline, clouded with dark brown within at base, with four cells, each cell with a brown or fuscous streak; veins dark brown, prominent.

Head with a few bristly hairs in front, the clypeus, juga and transverse ridge beneath eyes yellowish white, sometimes brownish or even black; a small pale spot between each eye and ocellus. Rostrum dark ferrugineous, shining, with terminal segment paler, extending to middle of hind coxae. Antennae dark brown, moderately pilose, with a few long scattered bristly hairs on last two segments; segment I yellowish white, with a large elongate black spot, sometimes almost entirely black; proportions—I, 16; II, 36; III, 21; IV, 20. Body beneath black, densely clothed with silvery gray pile. Legs black, with variable degrees of brownish markings sometimes almost entirely black, clothed with long grayish hairs, beneath much darker, shining and with longer hairs; femora with long brownish stripe in front, much widened at apices; tibiae often brownish beneath, sometimes quite brownish apically, with usual brownish spines; tarsi with second and often most of third segments brownish or testaceous. Pronotum nearly three times as wide at base as median length, strongly convergent anteriorly, narrower in front than head and eyes taken together, the lateral margins moderately explanate, slightly reflexed, nearly straight; callus with large discal impression, moderately swollen, not extending on explanate margins of pronotum; transverse furrow sinuate, deep, pitted at the bottom, the hind lobe deeply, broadly excavated behind, about one-half as long as the front lobe and two-thirds as long as callus; scutellum about as long as wide, the impression placed just in front of the middle. Pubescence not as dense on hemelytra as on pronotum and scutellum.

Length, 4.00 to 5.10 mm.; width, 1.90 to 2.25 mm.

Type (male), allotype (female) and 6 paratypes, Aztec, New Mexico, Aug. 26, 1934, taken on stones, C. J. Drake and Floyd Andre. Paratypes, 60 specimens, taken by the authors during August to October, 1949 in Colorado (Delta, Gateway, Skyway, Grand Junction, Georgetown, Ridgeway, Grand Masa and Telluride), Utah (Green River, Salt Lake City and Logan), Idaho (Twin Falls and Lewiston), Washington (Spokane), Wyoming (Jackson Lake and Rocksprings) and Canada (Coleman, Alberta).

S. azteca, n. sp., is primarily saxicolous, and most frequently taken resting on rocks and stones in very stony situations near the edge of water of streams and lakes. It is rarely taken on sand or wet mud, even near stony places. Some specimens were also collected on drift wood near the later.

Other shore bugs taken on stones in the same habitats were *Saldula nigrita* (Parshley), *S. explanata* (Uhler), *S. andrei* Drake. *Azteca* seems

to be more closely associated with the stony habitats than the other species. It was also dominant in numbers.

S. comatula (Parshley) is a larger, broader species and rather dull; the hemelytra are very variable in color and its legs are pale. *S. andrei* Drake is quite similar in size and form, but also has pale legs, and large prominent yellowish or yellowish orange markings on the hemelytra. The color and markings also separate it from *comatula*. *S. illinoensis* Drake is a smaller species, with rather sparse vesture of long hairs; the hemelytra have a moderately large, pale, subapical, marginal spot in the corium.

***Saldula ourayi*, n. sp.**

Small, obovate, black, with or without small, luteous or whitish markings or small rounded spots, the pubescence short, dense, dark golden; without vesture of long hairs. Head with a small pale spot between each eye and ocellus, the transverse callosities beneath eyes, clypeus and often juga yellowish white, swollen; rostrum ferrugineous, shining, reaching end of hind coxae. Antennae brownish black, shortly pilose, the first segment yellowish white, usually with a large elongate black spot, the second brownish apically, the two terminal segments with a few scattered bristly hairs; proportions—I, 12; II, 25; III, 14; IV, 15. Pronotum deep black, slightly shining, indistinctly pitted, deeply excavated behind, three times as wide at base as median length, not strongly narrowed anteriorly, the side margins slightly rounded and slightly reflexed; callus moderately swollen, not extending on explanate margins, with large, deep impression at middle; lobes separated by rather shallow arcuate furrow, finely pitted at bottom, the hind lobe about three-fourths as long as callus. Scutellum about as wide as long, deep black, slightly shining, indistinctly pitted, the pubescence of pronotum and scutellum slightly longer than on hemelytra.

Hemelytra black, rather dull; clavus usually without subapical pale spot; corium usually with two or four small, whitish or yellowish, rounded, small spots, often with a narrow, marginal, luteous stripe, the stripe often longly interrupted at middle; sometimes entire corium black and with only two small pale spots; membrane densely clouded with fuscous, non-transparent, with four cells, the veins a little darker; usually without dark spots in cells. Legs black, generally with some brown or fuscous markings, sometimes entirely black. Body beneath black, with dense grayish pile. Hemelytra slightly variable in length.

Length, 3.50 mm.; width, 1.62 mm.

Type (male), allotype (female) and 70 paratypes, Soap Lake, Washington, and series of lakes to the north to Deep Lake, Washington, Aug. 29, 1949, C. J. Drake and F. C. Hottes. Paratypes also from Colorado (Georgetown, Gateway and Delta), Idaho (Lewiston), Wyoming (Jackson Lake and Yellowstone National Park), Utah (Green River), California (San Francisco, Aug. 26, 1934, Drake and Andre), and Canada (Cranbrook, Brit. Col.).

Allied to *S. bassingeri* Drake, but easily separated by its larger size, darker color and different markings on hemelytra and dark legs. It was taken on the muddy and sandy shores of lakes and reservoirs of rivers. Soap Lake and the series of lakes north to Deep Lake are the only places where it was taken in large numbers. *S. pallipes* (Fabr.), *S. saltatoria* (Fabr.), and *S. comatula* (Parsh.) were often found in the same habi-

tats. At Deep Lake, 8 specimens of *Micracanthia pusilla* Van Duzee were taken at one small point in company with *ourayi* and *pallipes*. A few specimens of *S. ourayi* are conspicuously marked with two large flavous areas on each hemelytron, and might represent a distinct variety. The right paramere of a paratype from Soap Lake is figured. The parameres of *S. ourayi* differ distinctly in shape from those of *S. bassingeri* Drake. The hair on the hump of the parameres of *bassingeri* are much longer than those on the hump of the parameres of *ourayi* and from a distinct tuft.

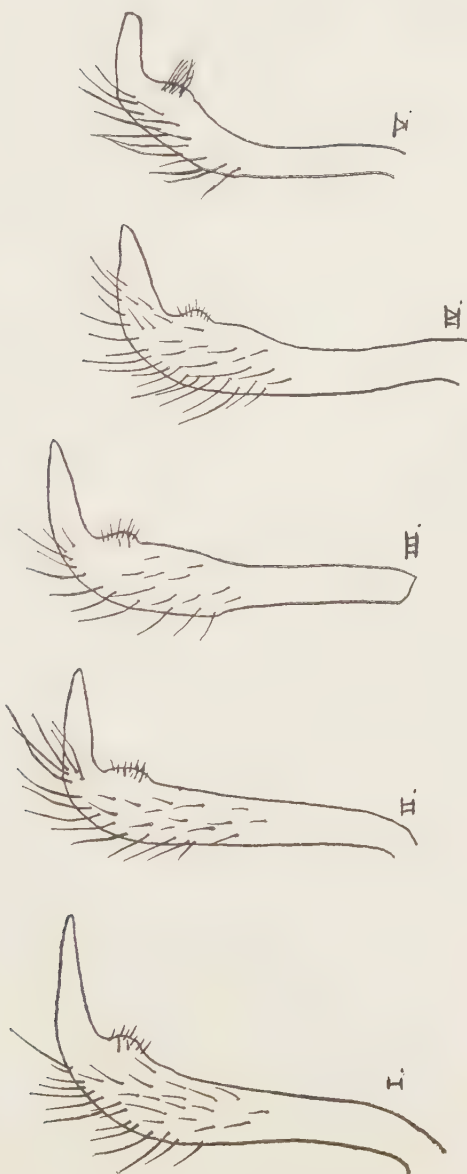


PLATE X

- I. *Saldula comatula* (Parsh.)
 II. *Saldula andrei* Drake.
 III. *Saldula azteca*, n. sp.
 IV. *Saldula ourayi*, n. sp.
 V. *Saldula bassingeri* Drake.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

SEVEN NEW SUBSPECIES OF BIRDS FROM
VENEZUELA

BY WILLIAM H. PHELPS AND WILLIAM H. PHELPS, JR.

The senior author wishes to thank Dr. John T. Zimmer of the American Museum of Natural History, Dr. Herbert Friedmann of the U. S. National Museum, Mr. W. E. Clyde Tood of the Carnegie Museum and Mr. Emmet R. Blake of the Chicago Natural History Museum for their help in the examination of specimens in their respective institutions.

The specimens listed as examined are in the Phelps Collection, Caracas, unless otherwise specified.

Names of colors are capitalized when direct comparison has been made with Ridgway's "Color Standards and Color Nomenclature."

***Chaetocercus jourdanii andinus*, new subspecies**

Type.—From Cubiro, Lara, Venezuela; altitude 1650 meters. No. 8799, Phelps Collection, Caracas. Adult male collected October 23, 1940, by William H. Phelps. (Type on deposit at the American Museum of Natural History.)

Diagnosis.—Closest to *C. j. rosae* of the Caracas region but the iridescent throat has a more rose colored, less purplish, tint.

Range.—The Subtropical Zone of the Venezuelan Andes from Lara to Táchira and of the Dept. Santander in Colombia.

Description of Type.—Upper parts nearest to Cosse Green; an ill defined whitish post-orbital stripe; lores slightly rufous. Chin and throat Tyrian Rose; a white band from side of neck across anterior breast; anterior breast, abdomen, sides and flanks Cosse Green; vent and patches on flanks white; under tail-coverts pale greenish edged with whitish. Wings Warm Blackish Brown; lesser coverts, under wing-coverts and axillaries Cosse Green. Tail Warm Blackish Brown, median rectrices with inner webs basally pale rufous.

Bill (in life) "black"; feet "brown." Wing, 34 mm; tail, 21; exposed culmen, 11; culmen from base, 16; tarsus, 11.

Remarks.—Sexes different. Size similar to *rosae*. Range of measurements: five adult males—wing, 33-35 (34) mm.; tail, 21-24 (22.2); exposed culmen, 11-12 (11.8); five adult females—wing, 33-38 (36.2); tail, 16-17 (16.4); exposed culmen, 12-13 (12.8). Measurements of *rosae*: three adult males—wing, 32-33 (32.3); tail, 22-24 (22.7); exposed culmen, 11-14 (13.7); two adult females—wing, 37-39 (38); tail, 15-16 (15.5); exposed culmen, 13-14 (13.5).

Females are similar in coloration to *jourdanii*. The Bucaral male has the throat intermediate between *andinus* and *rosae*, as would be expected

from its intermediate range. Those from Queniquea do not have the typical throats of *andinus*. Measurements of exposed culmen are given because of uncertainty in measuring from base.

Specimens Examined

C. j. jourdanii.—VENEZUELA: Caripe, 1 ♂, 1 ♀; Cerro Negro, 3 ♂, 3 ♀; Cerro Turumiquire, 4 ♂¹; Rincón de San Antonio, 1 ♂³; Los Palmales, 1 ♀²; Cerro Humo, 1 ♂ juv., 1 ♀. TRINIDAD: 1 ♂¹, 3 ♂², 2 ♀².

C. j. rosae.—VENEZUELA: Caracas, 1 ♀¹; Galipán, 2 ♂²; Colonia Tovar, 1 ♂²; Hda. Santa Clara, Carabobo, 1 ♂; Cumbre de Valencia, 1 ♂¹; Bucaral, Yaracuy, 1 ♂; Curimagua, Falcón, 1 ♂, 2 ♂ juv.; San Luis, 1 ♀; "Venezuela," 4 ♂².

C. j. andinus.—VENEZUELA: Cubiro, Lara, 2 ♂ (incl. type), 2 ♀; Guarico⁴, 1 ♂, 1 ♀; Páramo de Cendé, Trujillo, 1 ♀; Tabay, Mérida, 1 ♀; Páramo Conejos, 1 ♂², 2 ♀³; Páramo de los Pinos, 3 ♂²; El Valle, 2 ♀, 1 ♀³; Páramo de la Culata, 1 ♀²; Páramo Tambór, 1 ♂², 2 ♂³, 1 ♀³; "Mérida"¹, 1 ♂, 3 ♀; Boca de Monte, 1 ♀; Queniquea, Táchira, 2 ♂, 1 ♀; "Venezuela," 1 ♂, 1 ♂². COLOMBIA⁴: Pueblo Nuevo, Santander, 1 ♂, 3 ♀; La Palmita, 3 ♀.

***Bucco tamatia cuyunil*, new subspecies**

Type.—From Carabobo, Alto Río Cuyuni, Bolívar, Venezuela; altitude 240 meters. No. 46006, Phelps Collection, Caracas. Adult male collected September 16, 1948, by Manuel Castro. (Type on deposit at the American Museum of Natural History.)

Diagnosis.—Similar to *B. t. tamatia* except that the back is darker brown than in any other subspecies.

Range.—Known only from Carabobo on the upper Cuyuni River.

Description of Type.—Back and uropygium paler than Bone Brown, lighter on crown; feathers on forehead, pre-ocular region and upper tail-coverts heavily, and those of lower back and rump slightly, edged with buffy; a whitish nuchal collar; ear-coverts dusky, slightly edged with whitish; a white gular streak; sides of throat and neck black; throat and fore breast Tawny, paler on chin; rest of under parts whitish with a buffy tinge on abdomen and under tail-coverts, heavily spotted with dusky; under tail-coverts lightly spotted. Wings Natal Brown; remiges partially and lightly edged externally, heavily internally, with buffy; upper wing-coverts and tertials lightly edged and tipped with buffy giving a scaled appearance; greater under wing-coverts grayish, the lesser ones pale buffy. Tail Natal Brown, paler below, the rectrices lightly edged with buffy and lightly tipped with whitish.

Bill "black"; feet "gray"; iris "brown." Wing, 75 mm; tail, 62; exposed culmen, 23; culmen from base, 30; tarsus, 16.

Remarks.—Sexes alike. Size similar to *tamatia*. Range of measurements: four adult males—wing, 74-75 (74.7); tail (3), 59-62 (60.3); culmen from base (3), 28-30 (29); three adult females—wing, 76-78 (77.3); tail, 63-65 (63.7); culmen from base, 29-29 (29). Measurements of *tamatia*: five adult males from Cayenne and Surinam—wing, 74-80 (77.2); tail, 60-66 (63.4); culmen from base (4), 26-28 (27); five adult

¹Specimens in Chicago Natural History Museum.

²Specimens in American Museum of Natural History.

³Specimens in U. S. National Museum.

⁴Specimens in Carnegie Museum.

females from Surinam and British Guiana—wing, 75-81 (78.6); tail, 61-66 (63.4); culmen from base, 28-29 (28.2).

Specimens Examined

B. t. cuyunii.—VENEZUELA: Carabobo, 4 ♂ (incl. type), 3 ♀.

B. t. tamatia.—FRENCH GUIANA²: "Cayenne," 1 ♂. DUTCH GUIANA²: Kroata, 1 ♀; Javaweg, 1 ♂; Paramaribo, 1 ♂; "interior," 3 ♂, 3 ♀. BRITISH GUIANA: Annai², 1 ♀; Rupurumi River², 1 ♂; Kamaeusa², 1 ♀; Mutusi Hole², 1 ♀; "British Guiana," 3 (♀)²; Upper Mazaruni River, 1 ♂; Mambaro Creek, 1 ♀, 1 (♀). BRAZIL: Isla Macará, Rio Negro, 1 ♀. COLOMBIA²: Maipures, 1 ♂, 1 ♀. VENEZUELA: Salto Uraima, 1 ♀; Cerro Tonoro, 1 ♂, 2 (♀); Salto Arebuchi, 3 ♀; Cerro Tabarerupá, 1 ♀; Sanariapo, 1 ♂, 1 ♀; San Fernando de Atabapo, 2 ♂; El Platanal, 1 ♀; Puerto Yapacana, 1 ♂, 1 ♀.

B. t. hypnaleus.—BRAZIL²: Santarem, 1 ♀, 2 (2); Marajó Is., 1 (♀).

B. t. interior.—BRAZIL²: Campos Novas, Matto Grosso, 1 ♀; Tapira-poa, 1 ♀.

*B. t. pulmentum*².—ECUADOR: Boca Rio Curaray, 1 ♂, 1 ♀. BRAZIL: Rio Humytha, Rio Madeira, 1 ♀; "Napo," 1 (♀); "Upper Amazonia," 1 (♀).

Piprites chloris perijanus, new subspecies

Type.—From La Sabana, Río Negro, Perijá, Zulia, Venezuela; altitude 1300 meters. No. 6779, Phelps Collection, Caracas. Adult male collected March 5, 1940, by Alberto Fernández Y. (Type on deposit at the American Museum of Natural History.)

Diagnosis.—Nearest to *P. c. tschudii* from which it differs by a more extensive and prominent yellowish forehead, less buffy or chestnut.

Range.—Known only from the type locality.

Description of Type.—Crown, back and uropygium yellower than Warbler Green; forehead Primuline Yellow; pre-ocular region and lores pale yellowish; eye-ring yellowish white; ear-coverts and sides of neck grayish, tinted with olivaceous. Chin yellow, more greenish on throat and still more greenish on breast; abdomen and under tail-coverts Citron Yellow; sides, flanks and axillaries yellowish green. Wings Fuscous; remiges narrowly edged with greenish; inner vanes and tips of innermost tertials broadly whitish; greater wing-coverts broadly tipped with yellowish white and median coverts more narrowly, forming two wing bands; band of wing Citron Yellow; under wing-coverts mixed yellowish, white and dusky; inner vanes of remiges edged basally with yellowish white. Tail Fuscous, paler below; rectrices faintly edged with greenish and prominently tipped with whitish.

Bill (in life) "gray"; feet "gray"; iris "brown." Wing, 68 mm; tail, 50; exposed culmen, 8; culmen from base, 12; tarsus, 16.

Remarks.—Size similar to *tschudii*. Range of measurements: two adult males—wing, 68, 69 mm; tail, 50, 50; culmen from base, 12, 12. Measurement of *tschudii* from Ecuador: five adult males—wing, 66-69 (67.4); tail, 43-47 (44.8); culmen from base, 12-13 (12.6); five adult females—wing, 67-72 (68.6); tail, 42-49 (45.6); culmen from base, 12-13 (12.6).

The range of the new subspecies is very distant from the nearest record for the species which is *antioquiae* from Dept. Antioquia, Colombia. There is a specimen of *chlorion* in the Phelps Collection from the State of Carabobo, the only known occurrence in northern Venezuela.

Specimens Examined

P. chloris antioquiae.—COLOMBIA: La Frijolera, Antioquia, 1 ♂² (type).

P. chloris perijanensis.—VENEZUELA: La Sabana, Sierra de Perijá, 2 ♂ (incl. type).

P. chloris chlorion.—VENEZUELA: Hda. Santa Clara, Carabobo, 1 ♀; Caño Cuao, Terr. Amazonas, 2 ♂, 1 (♀); pica Yavita-Pimichín, 4 ♂, 1 ♀; Santa Elena, Bolívar, 1 ♀; Hato Santa Teresa, 1 ♀; Raudal Guaiquinima, 1 ♂; Erebenquén, 1 ♂; Salto María Espuma, 1 ♂; Cerro Ptari-tepui, 7 ♂, 2 ♀, 2 (♀); Cerro Paurai-tepui, 1 ♂, 1 ♀, 1 (♀); Altiplanicie de Nuria, 3 ♂, 2 ♀; foot of Cerro Duida, 2 ♀²; Playa del Río Base, 1 ♂²; El Meray, 1 ♂²; Cerro Auyan-tepui, 1 ♀². BRITISH GUIANA²: 1 (♀). BRAZIL²: Faro, 5 ♂, 2 ♀; Villa Bella Imperatriz, 1 ♂; Cussary, 1 ♀.

P. c. bolivianus.—BRAZIL: Igarapé Amorim, Rio Tapajoz, 1 ♂².

P. c. tschudii.—VENEZUELA²: Río Guainía, junction with Caño Casiquiare, 2 ♂, 2 ♀; opposite El Meray, 1 ♀. COLUMBIA: Macacuni, 1 ♂. BRAZIL²: Rio Curucuryari, 1 ♂. ECUADOR²: Lagarto, 1 ♂, 1 ♀; Zamora, 1 ♀, 1 (♀); below San José de Sumarco, 1 ♀; Boca Río Curaray, 1 ♂, 2 ♀; Río Suno Abajo, 1 ♀; Río Suno, above Avila, 1 ♂, 1 ♀.

***Pachyrhamphus castaneus parui*, new subspecies**

Type.—From Cerro Parú, Terr. Amazonas, Venezuela; altitude 1600 meters. No. 46817, Phelps Collection, Caracas. Adult male collected February 20, 1949, by Kathleen D. Phelps. (Type on deposit at the American Museum of Natural History.)

Diagnosis.—Nearest to *P. c. saturatus* but differs from all other subspecies by darker crown, back and lower parts.

Range.—Known only from the Subtropical and upper Tropical Zone of Cerro Parú between 940 and 1600 meters.

Description of Type.—Top of head Chestnut, base of feathers dusky giving a mottled appearance; rump paler, merging into the Tawny of upper tail-coverts; post-ocular stripe and narrow nuchal collar dark grayish; lores dusky, ear-coverts dusky tawny. Under parts Ochraceous Tawny, darkest on side of throat, breast and sides, merging into the whitish chin and Cinnamon-Buff under tail-coverts. Wing Blackish Brown, the feathers edged with Tawny, except tips of primaries and secondaries; under wing-coverts and axillaries Ochraceous-Tawny. Tail Tawny above, under surface pale Cinnamon-Brown; inner webs of rectrices paler, outer webs and middle rectrices more dusky, all very narrowly tipped with whitish.

Bill (in life) "maxilla black, mandible slate"; feet "cinder"; iris "brown." Wing, 80 mm; tail, 58; exposed culmen, 12; culmen from base, 15; tarsus, 20.

Remarks.—Size similar to *saturatus*. Range of measurements: three adult males—wing, 75-80 (77) mm; tail, 58-60 (58.7); culmen from base, 15-15 (15). Two adult males of *saturatus*—wing, 73-77 (75); tail, 51-55 (53); culmen from base, 14-15 (14.5); three adult females—wing, 70-74 (72); tail, 49-57 (53); one adult female from Hato Santa Teresa—wing, 72; tail, 53; culmen from base, 16. Five adult males of *intermedius*—wing, 73-77 (75.2); tail, 54-58 (55.6); culmen from base, 15-15 (15); five adult females—wing, 69-74 (71.2); tail, 50-57 (54.6); culmen from base, 14-16 (15.2).

It is noteworthy that this new form is the only one whose range extends into the Subtropical Zone. All the others inhabit the Tropical Zone.

The species was only known from southern Venezuela by one specimen of *saturatus* in our collection from Hato Santa Teresa, Río Uairen, near the Brazilian boundary west of Mt. Roraima.

Specimens Examined

*P. c. castaneus*².—BRAZIL: 17⁵. PARAGUAY: 3⁵.

P. c. amazonus.—BRAZIL²: 21⁵.

P. c. saturatus.—BRAZIL²: 2⁵. PERU²: 3⁵. VENEZUELA: Hato Santa Teresa, 1 ♀.

Pl. c. parui.—VENEZUELA: Cerro Parí, 3 ♂ (including type).

P. c. intermedius.—VENEZUELA: 14^{2,5}; San Luis, 1 ♂, 1 ♀; Curiagua, 1 ♂, 2 ♀; Urama, 1 (?); Colonia Tovar, 1 (?); Sierra de Carabobo, 1 (?); San José de Los Caracas, 1 ♂; Cerro Golfo Triste, 2 ♂, 1 ♀; Cerro Negro (Miranda), 1 ♂, 1 ♀, 1 (?); Los Altos, 2 (?); Quebrada Bonita, 2 ♂, 1 (?); Caripe, 1 ♂, 1 ♀, 2 (?); El Pilar, 1 ♀; Cerro Azul, 1 ♀.

***Leptopogon superciliaris pariae*, new subspecies**

Type.—From Cerro Azul, Paria Peninsula, Sucre, Venezuela; altitude 900 meters. No. 44096, Phelps Collection, Caracas. Adult of undetermined sex collected May 27, 1948, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis.—Differs from *L. s. venezuelensis* of northern Venezuela by a darker, more grayish, less yellowish, breast, a paler yellow abdomen and a darker green, less yellowish, back. Differs from *poliocephalus* of Colombia by more extensive white on forehead and superciliaries and whiter, less buffy, wing bands.

Range.—Known from the tip of the Paria Peninsula in the Tropical and lower Subtropical Zones to an altitude of 900 meters and from the nearby island of Trinidad.

Description of Type.—Back and uropygium darker than Yellowish Oil Green; crown and nape Chaetura Drab; center of forehead dusky uniform with crown but feathers with some whitish tips; rest of forehead and pre-ocular region extensively whitish; wide post-ocular grayish white streak; ear-coverts dusky, mixed with gray. Breast and sides Deep Grape Green merging into the whitish throat and chin and into the Martius Yellow abdomen; under tail-coverts and axillaries whitish; wings Fuscous; remiges, except three outermost pairs, edged with yellowish green, more widely on the tertials; wing-coverts tipped with whitish forming two prominent bands; under wing-coverts mixed brownish and whitish. Tail Benzo Brown, paler below, the rectrices edged externally with greenish.

Bill (in life) "black"; feet "gray"; iris "brown." Wing, 59 mm; tail, 48; exposed culmen, 13; culmen from base, 15; tarsus, 15.

Remarks.—Sexes alike. Size similar to *venezuelensis*. Range of measurements: three adult males from Cristóbal Colón—wing, 63-66 (64.7) mm; tail, 50-57 (52.7); culmen from base, 14-15 (14.7); three adult females from Cristóbal Colón and Cerro Azul—wing, 60-62 (61); tail, 50-55 (52);

⁵For localities see Zimmer, *Studies of Peruvian Birds*, Am. Mus. Nov., No. 894, pp. 8-9, 1936.

culmen from the base 14-14 (14); one adult of undetermined sex from Cerro Azul (see the type). Measurements of *venezuelensis*: five adult males from the Caracas region—wing, 63-68 (66); tail, 53-62 (56.2); culmen from base, 15-15 (15); five adult females—wing, 58-62 (60.4); tail 47-62 (54.2); culmen from base, 14-15 (14.6).

Specimens Examined

*L. s. albidiventer*².—BOLIVIA: 13⁶. PERU: 9⁶.

*L. s. superciliaris*².—PERU: 22⁶. Ecuador: 6⁶.

*L. s. transandinus*².—ECUADOR: 11⁶. COLOMBIA: 3⁶. PANAMA: 7⁶.

*L. s. hellmayri*².—PANAMA: 4⁶.

L. s. poliocephalus.—COLOMBIA²: "Bogotá," 5 (?); Villavicencio, 2 ♂; Buena Vista, 1 ♂, 1 ♀; east of Palmira, 1 ♂, 1 ♀; Peque, 1 ♂. VENEZUELA: La Sabana, Perijá, 1 ♂, 1 (?).

L. s. venezuelensis.—VENEZUELA: Bramón, 1 ♀, 1 (?); Queniquea, 1 ♂, 1 ♀; Cerro El Cerrón, 2 ♂; Cerro El Cogollal, 1 (?); Cubiro, 1 (?); Altamira (Barinas), 1 ♂, 1 ♀, 2 (?); San Luis, 1 (?); Curimagua, 1 (?); Bucaral, 1 ♀; Cumbre de Valencia, 1 ♀²; Sierra de Carabobo, 1 ♂, 1 (?); Hda. Altamira (Carabobo), 1 (?); Colonia To-var, 1 ♂; Cotiza², 1 ♂, 2 ♀, 2 (?); Hda. Izcaragua, 1 ♀; San José de Los Caracas, 1 (?); Cerro Golfo Triste, 1 ♂, - (?); Cerro Negro (Miranda), 5 ♂, 4 ♀, 7 (?); Quebrada Bonita, 3 ♂, 3 ♀, 3 (?); Quebrada Seca², 1 ♂, 3 ♀; Río Neverí², 1 ♂, 1 ♀; El Guácharo², 1 ♂, 1 ♀; Caripe, 3 ♂, 1 ♀, 1 (?)².

L. s. pariae.—VENEZUELA: Cerro Azul, 1 ♀, 1 (?) (type); Cristóbal Colón², 3 ♂, 2 ♀. TRINIDAD²: Carenage, 1 ♂; Heights of Aripo, 1 ♂.

pp. 5, 1941.

Compsocoma flavinucha virididorsalis, new subspecies

Type.—From Cerro Golfo Triste, Aragua, Venezuela; altitude 1200 meters. No. 19415, Phelps Collection, Caracas. Adult male collected August 29, 1942, by Ramón Urbano. (Type on deposit at the American Museum of Natural History.)

Diagnosis.—Similar to *C. f. venezuelana* except that green cast extends over the back instead of being confined to rump.

Range.—Known only from Cerro Golfo Triste in the lower Subtropical Zone at altitudes from 1000 to 1300 meters.

Description of Type.—Head black, the crown, from between the eyes back to the nape and 8 cm. in width, darker than Lemon Chrome; back and uropygium dark greenish, the feathers terminally dusky thus giving a mottled appearance, slightly more greenish on rump. Underparts and axillaries darker than Lemon Chrome. Wings Fuscous; remiges, except the outermost pair, edged externally, except terminally, with Turquoise Green; inner vanes edged basally with whitish; innermost tertials and greater wing-coverts black; lesser wing-coverts Light Violet Blue; under wing-coverts mixed dusky and yellowish white. Tail blackish, paler below, the rectrices broadly edged externally with Turquoise Green except the outermost pair.

Bill (in life) "black, base blue"; feet "black"; iris "reddish

⁶For localities see Zimmer, *Studies of Peruvian Birds*. Am. Mus. Nov., No. 1126,

brown." Wing, 90 mm; tail, 68, exposed culmen, 17; culmen from base, 19; tarsus, 24.

Remarks.—Sexes alike. Size similar to *venezuelana*. Range of measurements: three adult males—wing, 88-90 (89) mm; tail, 66-68 (67.3); culmen from base, 19-19 (19); two adult females—wing, 85-87 (86); tail (1), 64; culmen from base, 19-19 (19); one of undetermined sex—wing, 85; tail, 63; culmen from base, 19. Measurements of *venezuelana* from the Caracas region: five adult males—wing, 86-91 (87.4); tail, 62-67 (63.8); culmen from base, 17-19 (18.4); five adult females—wing, 88-93; tail, 65-70 (68.2); culmen from base, 19-20 (19.4).

Specimens Examined

*C. f. somptuosa*².—PERU: 21⁷. ECUADOR: 7⁷.

*C. f. flavinucha*².—PERU: 18⁷. BOLIVIA: 21⁷.

*C. f. baezae*².—ECUADOR: 9⁷.

*C. f. cyanoptera*².—Ecuador: 18⁷. COLOMBIA: 41⁷.

C. f. victorini.—COLOMBIA²: 28⁷.

C. f. venezuelana.—VENEZUELA: var. locs.⁷, 16²; Bucaral, 1 ♀; Las Quiguas, 1 ♂; Colonial Tovar, 7 ♂, 1 ♀; No León, 1 ♂, 2 ♀; El Junquito, 3 ♂, 2 ♀, 1 (♀); Hda. Izcaragua, 1 ♀.

C. f. virididorsalis.—Cerro Golfo Triste, 3 ♂ (incl. type); 2 ♀, 1 (♀).

Rhodinocichla rosea beebei, new subspecies

Type.—From La Sabana, Río Negro, Perijá, Zulia, Venezuela; altitude 1300 meters. No. 7015, Phelps Collection, Caracas. Adult male collected February 27, 1940, by William H. Phelps, Jr. (Type on deposit at the American Museum of Natural History.)

Diagnosis.—The male differs from all other subspecies of *R. rosea* by the superciliary stripe which in this new form is entirely lacking or very indistinct, instead of prominent.

Range.—The Sierra Perijá in the lower Subtropical Zone.

Description of Type.—Crown dark Citrine, mixed with dusky; forehead, except in the center, paler than Rose Red; back and uropygium grayish olive; a barely perceptible superciliary streak, rose colored above the eye and grayish post-orbitally; lores and sides of head black. Chin and throat paler than Rose Red, darker on breast and merging into Geranium Pink on abdomen and under tail-coverts; sides of neck, sides, flanks, thighs and axillaries grayish olive, the latter mixed with dark crimson. Wings Fuscous, the under surface paler with exposed edges of remiges grayish basally; remiges except the outermost, edged externally with olive gray; wing-coverts heavily edged with gray; a prominent patch on bend of wing, and edge of wing, paler than Rose Red; under wing-coverts mixed whitish and grayish. Tail Fuscous, paler below.

Maxilla (in life) "black"; mandible "horn color"; feet "brownish pearl"; iris "brown". Wing, 81 mm; tail, 80; exposed culmen, 19; culmen from base, 24; tarsus, 27.

Remarks.—Size similar to *rosea*. Range of measurements: five adult males—wing, 80-83 (80.8) mm; tail, 76-82 (78.6); culmen from base, 22-24 (23.2); one adult female—wing, 78; tail, 76; culmen from base, 22. Measurements of *rosea*: three adult males—wing, 81-82 (81.6); tail (3), 80-83 (81.5); culmen from base, 23-24 (23.3); two adult females—

⁷For localities see Zimmer, *Studies of Peruvian Birds*, Am. Mus. Nov., No. 1262, pp. 8-9, 1944.

wing, 77-79 (78); tail, 76-80 (78); tail, 76-80 (78); culmen from base, 23-24 (23.5).

Description of female. Crown dark Citrine, mixed with dusky; back and uropygium near Brownish Olive; forehead, except in center, and superciliary stripe, anteriorly, Ochraceous-Orange; the prominent superciliary streak white posteriorly; lores and sides of head black. Chin, throat, breast and abdomen Ochraceous-Orange, darkest on breast; lower abdomen whitish; sides, flanks, thighs and axillaries grayish olive; under tail-coverts Xanthine Orange. Wings Fuscous, the under surface paler with exposed edges of remiges grayish basally. Remiges edged externally with olive gray except outermost; wing-coverts edged with gray; a prominent patch on bend of wing, and bend of wing, Ochraceous-Orange; under wing-coverts mixed ochraceous and gray. Tail Benzo Brown, paler on under surface.

Every one of the specimens examined of the other subspecies, both males and females, have very prominent superciliary streaks.

It gives us great pleasure to name this beautiful bird in honor of Dr. William Beebe who, during a half century of intense scientific research, has made so many valuable contributions to Venezuelan ornithology.

Specimens Examined

R. r. rosea.—VENEZUELA: Caracas¹, 4 ♂, 4 ♀; Galipán, 1 ♀²; San Julián, Macuto, 1 ♂³; San José de los Caracas, 1 ♂; Pie del Cerro, Aragua, 1 ♂⁴; Puerto La Cruz, 1 ♂⁴, 2 ♀⁴, 1 ♂³; Sierra de Carabobo, 1 ♂⁴; San Esteban, 2 ♂⁴, 1 ♀⁴, 1 ♂², 1 ♀²; Cerro Negro, Miranda, 3 ♂; Bucaral, Yaracuy, 2 ♂; El Hacha⁴, 1 ♂, 1 ♀; Aroa⁴, 6 ♂, 2 ♀; Guarico, Lara, 1 ♂⁴; Cerro Bucarito, 1 ♂²; Anzoategui⁴, 1 ♂; San Luis, Falcón, 2 ♂, 3 ♀.

R. r. zeebei.—VENEZUELA: La Sabana, 1 ♂, 1 ♀, 2 ♂⁸; Ayapa, Perijá, 2 ♂⁹.

R. r. harteri.—COLOMBIA: San Antonio², 2 ♂, 1 ♀; Anolaima, 1 ♀²; "Colombia", 1 ♀¹; "Bogotá",² 1 ♂, 2 ♀.

R. r. eximia.—(var. locs.), 277². PANAMA: (var. locs.), 6 ♂³, 5 ♀³, 1 ♂¹. COSTA RICO: (var. locs.), 3 ♂³, 1 ♀³, 9 ♂⁴, 4 ♀⁴; Buenos Aires¹, 5 ♂, 4 ♀.

R. r. schistacea.—(var. locs.), 13². MEXICO: Colima¹, 3 ♂, 4 ♀.

⁸Specimens in Pons Collection, Maracaibo.

⁹Specimens in Museo de Ciencias Naturales "La Salle," Caracas.

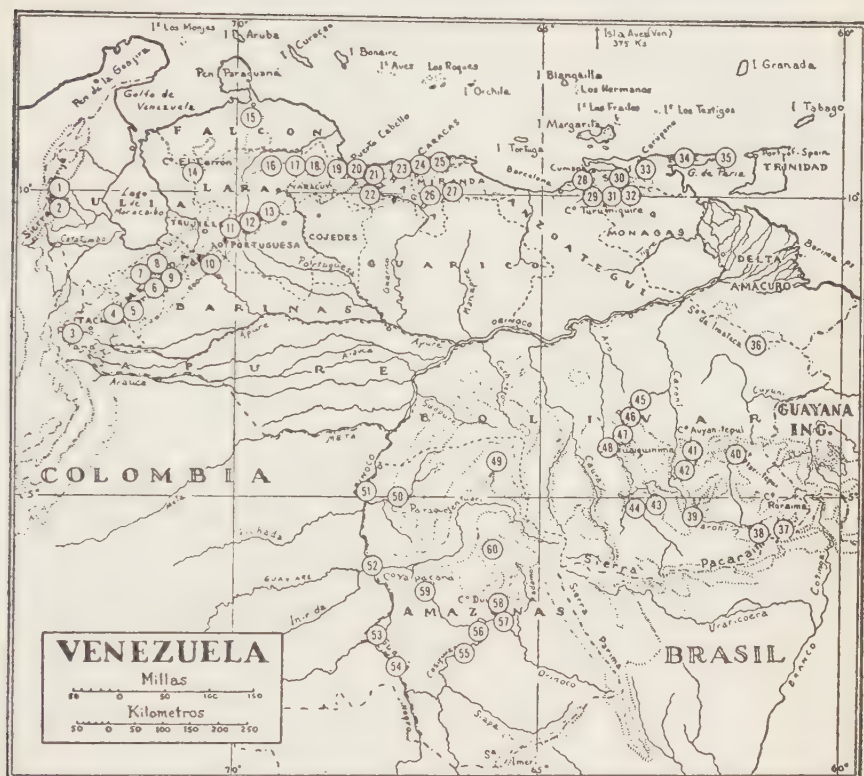


PLATE XI.

LIST OF LOCALITIES

- | | | | |
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| 12 | Anzoátegui | 50 | Cua, Caño |
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| 2 | Ayapa, Cerro | 15 | Curimagua |
| 35 | Azul, Cerro | 58 | Duida, Cerro |
| 5 | Boca de Monte | 6 | Egido |
| 3 | Bramón | 14 | El Cerrón, Cerro |
| 18 | Bucará | 14 | El Cogollal, Cerro |
| 12 | Bucarito, Cerro | 32 | El Guácharo |
| 32 | Caripe | 18 | El Hacha |
| 22 | Carabobo, Sierra | 24 | El Junquito |
| 24 | Caracas | 56 | El Merey |
| 55 | Casiquiare, Caño | 33 | El Pilar |
| 11 | Cendé, Páramo de | 49 | El Platanal |

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24	Galipán	59	Puerto Yapacana
26	Golfo Triste, Cerro	29	Quebrada Bonita
54	Guainía, Río	30	Quebrada Seca
48	Guaiquinima, Raudal	4	Queniquea
12	Guarico	31	Rincón de San Antonio
34	Humo, Cerro	25	San José de los Caracas
25	Izcaragua, Hda.	20	San Esteban
1	La Sabana	52	San Fernando de Atabapo
20	Las Quiguas	24	San Julián
28	Los Altos	15	San Luis
30	Los Palmales	51	Sanariapo
44	María Espuma, Salto	21	Santa Clara, Hda.
27	Negro, Cerro (Miranda)	37	Santa Elena (Bolívar)
32	Negro, Cerro (Monagas)	37	Santa Teresa, Hda.
28	Neverí, Río	48	Tabarerupá, Cerro
23	No León	9	Tabay
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